THE IRON AGE

New York, March 3, 1927

ESTABLISHED 1855 VOL. 119, No. 9

GEORGE W. PRENTISS

Wire Company Seventy Years Old

Difficulties of Early Years Reflected in Letter Books of Founder—Continuous Tinning of Wire Among Improvements Firm Introduced

BY JOHN NELSON

SEVENTY years ago, in the spring of 1857, George W. Prentiss, a young man with a long line of New England ancestry behind him, established in Holyoke, Mass., the wire business which, as George W. Prentiss & Co., bears his name and which, without interruption, has remained under the ownership and management of his family. He entered the industry as a manufacturer in troublous times. There was a highly organized opposition to meet, especially from Worcester manufacturers, whose wire business had strongly entrenched itself in the trade, and the Civil War was coming on.

When the war reached its height the new wire mill passed through its most critical period. While the demand for wire increased, the plant was confronted with the complexities of soaring prices of raw materials, which accompanied premium prices of gold, and an extreme scarcity of labor, which grew progressively worse as the Union army levied upon the man power of the North. Conditions were such as to try the metal of a young man who had ventured into a field where he had to depend solely upon his own acumen and enterprise. In spite of these circumstances the infant industry grew lustily, until quick expansion was imperatively demanded. This was carried through in 1862.

The record of this early period in Mr. Prentiss's career, as contained in his letter books, shows how through fair dealings with his customers and competitors and a high standard of product, he established the good name that spelled success throughout his own life and has characterized the firm since his death under the management of his son and grandson. Evidence of this is found in the fact that customers who began to do business with the founder in the first years of his manufacturing have been on the books of the firm continuously to the present day.

George W. Prentiss was born in Claremont, N. H., Oct. 10, 1829, a direct descendant from Capt. Thomas Prentiss, trooper, who settled in Cambridge, Mass., about 1636. Samuel Prentiss, the father of George W., was a tanner and currier in Claremont. The boy graduated from the village high school and for a time was employed as a clerk in Fairhaven, Mass. From there he went to Worcester to enter the office of the Henry Washburn Wire Works, where he remained for a number of years, and left to assume charge of the office of the Norway Iron Works at South Boston. In those days office and mill were not so widely separated as they usually are today. The office man was naturally much in the works and became familiar with materials and processes as well as with the routine of bookkeeping and sales. It is to be presumed that young Prentiss was observant and ambitious and saved his money. He was 27 years old when he launched out for himself, establishing the wire business in Holyoke in what was known as the small mill of the Parsons Paper Co.

The first few years must have been strenuous ones. In the beginning there was a partnership, known as Prentiss, Gray & Co., but only a short time elapsed when Mr. Prentiss became the sole owner. His quick success and the esteem in which he was held was evidenced when the Holyoke Water Power Co., which controlled the water rights of the Holyoke falls and supplied power to industries, erected a brick mill for him. This was in 1862. The rapid development of his business dated from that year.

Erected Own Plant in 1869

In 1869 Mr. Prentiss bought land on Dwight Street and erected mill buildings of his own. In connection with these he obtained valuable water rights, which

insured cheap power for years to come and which still furnish much of the power that operates the firm's machinery. The plant was added to from time to time, until it now covers all of the tract and contains the principal departments of the business.

From the beginning equipment was maintained on a high plane of efficient production. New machinery and processes were installed as the wire industry developed them, and in more than one instance Mr. Prentiss was a pioneer in bringing machinery and methods to the standard of practical usefulness.

Years passed. Until 1871, when he took his cousin, M. W. Prentiss, into the firm, he conducted the business alone. He had married in 1862, and his one son, William A. Prentiss, entered the business as a lad in 1877. As the son grew older and accumulated experience his father turned over to him more and more of the responsibilities of management. Long before the death of the elder Prentiss in 1915, his son had become the active head of the business, the founder continuing his active interest as an adviser only.

Similarly, William A. Prentiss took into his business his son, George W. Prentiss II, and, similarly, also gradually transferred to him the duties of active management, retaining the position which he now holds as president of the corporation, the son being the treasurer and general manager. So the management has passed down from father to son and grandson in three generations of unvarying policy with respect to the standard of products and relations with customers.

Finer Sizes of Wire Made from the Beginning

In the beginning the company manufactured the finer sizes of iron wire, chiefly tinned and annealed, and specialties, including card wire, broom wire and tinned covering wire for music strings. An invoice dated April 9, 1863, covers a shipment of tinned covering wire to Chickering & Sons, piano builders, to be used in the manufacture of piano strings. Incidentally, Chickering & Sons are still buying this class of wire from the Holyoke mill.

Later, of course, steel wires were added to the mill's products. All through the 70 years the firm has confined itself to the finer sizes. The carbon range of the line runs all the way from pure iron, such as ingot iron and "Swedes" iron, to 0.80 per cent carbon. Thus all grades are furnished, soft and hard, tinned and bright, in coils, on spools or cut to straight lengths. The firm's specialties are many. Since it is situated in the heart of New England, the textile industry is naturally an important customer, and the Prentiss products have come to include steel heddle, twin-heddle, tempered card, ring, traveler and other wires having exacting requirements. Included in the general products are tinned annealed wire, rope wire, clip wire, millinery wire and miscellaneous wires, round and flat, all in the finer sizes.

Introduced Continuous Tinning of Wire

The mill early became active in the development of new processes. The senior Prentiss had plenty of enterprise. He was the first to use the continuous method of tinning wire. Formerly the bundles were dipped in a tinning bath, the excess tin was shaken off, and the wire was given a final light draft to smooth its finish. Mr. Prentiss was also among the first to adopt continuous tempering and patent annealing of carbon steel wire. He collaborated with the inventor of the first wire stitching machine used for bookbinding and similar work. The first order for bookbinders' wire was made on May 1, 1875, and for many years afterward the mill manufactured all of the wire used for this purpose. Bookbinding and stitching wire are still important lines of the mill.

George W. Prentiss's early letter books, which are valued possessions of the firm, give much intimate information concerning the wire industry in the period centering about the Civil War, during which the Holyoke wire business was going through the critical time of establishing itself in the trade. No Sherman anti-trust law was then on the statute books. Manufacturers got together to fix prices, and their customers were soon informed regarding such agreements. The mills frequently notified one another of changes in their lists, the larger houses usually taking the initiative. Worcester, Mass., was then the chief center of wire manufacturing, and leading firms there seem to have been free in urging upon their competitors elsewhere the advancing of prices in a strong market. But, as was written to a customer in Mr. Prentiss's handwriting in his letter book, under date of May 3, 1863:

"I presume I shall not be notified so promptly when the larger manufacturers drop their prices as I was when they put them up."

There was nothing of philanthropy in price suggestions between competitors.

Another letter, dated April 8, 1863, is typical of Mr. Prentiss's dealings with his customers:

"The prices of all kinds of wire continue to be as high as at any time yet. This I can only account for by the great demand, which is more than the manufacturers can supply. I had a letter this week from a Worcester manufacturer asking me to put my prices up to 29c. per lb. for broom wire. They are getting 29c. per lb. for what I charge you 25c., and do not put in such good stock. I refused, as I mean to deal fairly with my customers. I shall not put the price of wire up unless stock goes up, whatever the demand, and when there is any decline in price by any manufacturer I shall come down with my prices."

Rods Advanced $25 a Ton in One Month

A letter, characteristic of the day, was written to Horace Lamb, a wire manufacturer of the neighboring town of Northampton, under date of Jan. 23, 1863:

"Iron has been advancing in price to correspond with the recent rise in gold and exchange. Rods are quoted $25 a ton higher than they were in December and will go still higher if gold does. Now will you put the price of broom wire up to 18 and 19c. per lb., net cash, 5 per cent discount to the largest customers, if I will do the same? We can just as well get it as less, and must to make it pay."

Writing to I. Washburn & Moen, Feb. 4, 1863, Mr. Prentiss said:

"Your favor of yesterday's date with list prices for wire is received. I cheerfully agree not to undersell your prices for card wire but should rather have a better understanding with all the manufacturers of broom wire before naming your prices to all my customers and agreeing not to undersell them."

The way the trade got together on occasion to settle price questions is indicated in a letter to George G. Nelson, 81 John Street, New York, dated Nov. 30, 1863:

"I shall be present at the meeting of wire manufacturers Dec. 10, if possible, but as I have no one to leave my business with or send as representative, it may not be that I can leave. I am free to say, however, that I shall most heartily fall in with any arrangement that may be made, and fairly and honorably lived up to by all, to make the prices of wire uniform and in proportion to the cost of manufacture."

The result of this meeting was told by Mr. Prentiss in a letter dated Jan. 23, 1864, to William Bromwell & Co.:

"About Jan. 1 the iron wire manufacturers agreed upon uniform prices for market and stone wire so there

might be some steadiness and regularity to the market. I presume you have had the quotations, which are as follows:

"From the rod to No. 18, inclusive, list.

"No. 19 to 26, inclusive, 15 per cent discount.

"No. 27 to 36, inclusive, 25 per cent discount..

"Six months, or 5 per cent discount for cash in 30 days.

"Four per cent from this to some of the largest wholesale dealers, including your house.

"The wire delivered in New York, if desired by the purchasers.

"These are the lowest rates that I can sell at in good faith or that the wire can really be offered at. I shall regret very much to lose your patronage, and if you favor me with orders will try my best to give you the best we can make, and if prices drop while I may have your order incompleted, I will drop my price on the balance due you, or, if rates advance, all orders received shall be filled at the old price. Coppered wire I will put in at 5 per cent above common and tinned 4c. per lb. above common; same terms. Please let me hear from you, and if there is anything that I can do honorably to make it an object for you to order from me, I shall be happy to do it."

WILLIAM PRENTISS

THREE generations have carried on the sound policies established at the inception of the business. William A. Prentiss, only son of the founder and now president of the company, entered the organization as a boy in 1877. Likewise his son, George W. Prentiss II, became identified with the company, now being treasurer and general manager

GEORGE W. PRENTISS, II.

Labor Scarce During Civil War

Mill organization was a transient thing in war days. Apologizing to a customer for a delay in delivery, Mr. Prentiss wrote, Oct. 23, 1862:

"Help has been very hard to get; all our men have gone to war; so that it has taken at least a month longer to get ready to start my new mill than I expected."

The wages paid 70 years ago seem small enough compared with present day standards. In a letter written in 1862, Mr. Prentiss said:

"I am in want of a young man to work drawing wire. Mr. Hatch says your son, Edward, would like the place. If so, let him come at once, say on Monday, if possible. The pay will be 75c. per day for the first three months, $1 a day for the next six months."

Replying to an application for a job he wrote:

"I have a fair hand that cleans my card wire, and should not wish to change unless I was to get a better one—one of more experience. There is another large wire mill in this place, W. E. Rice & Co., and if you are a good workman I think you could get a job either with me or them, but could not promise one. Wages for good cleaners are $1.75 a day; board is now $3.50 a week."

Another letter says:

"Good wire drawers are now getting here from $1.50 to $2 per day; steady work through the year."

The ethics of the day as to hiring a competitor's help are voiced in the following letter of Feb. 11, 1863:

"I write to inquire if you know of a good man that I can get to come out and work for me. I want a first-rate, good man, one that can straighten card wire or draw it. . . .

"Since I wrote you last July I have got into my new mill and have had more orders twice over than I could fill. Everything runs tip top. I write to you because you have always been friendly to me, and I think you would know if there was such a hand as I want that could be hired. I do not wish to get you to leave your place and employers, nor do I wish to hire away any hand from your shop. I thought perhaps you would know of some hand not at work there, or that might be intending to leave anyway. If you think of anyone that I might be able to get please write me. and you will do me a kindness."

Sharp Price Fluctuations During Civil War

As to the struggle to meet the fluctuations of prices due to Sterling exchange and other abnormal factors, the following extracts from letters written in 1863 tell the story:

"I know that No. 23 tinned broom wire now costs more than 18c. per lb. to manufacture. Iron never was so scarce and high as at present. A 15 per cent advance has been made upon the cost of the bar in England and Sweden. This, together with extra freights, war risk, extra cost of rolling to wire rods, Government tax, and then the additional cost of making into wire, which has increased steadily for some time past, has compelled the wire manufacturers to adopt fair uniform prices or stop business. The price given you in my last letter, by accurate estimate pays but 10 per cent profit in currency and is the lowest it can be bought for of any manufacturer in any quantity of wire from one barrel to 10 or more. I sell a great quantity of wire to New York wholesale dealers, but at precisely the same price as to you."

Explaining why prices had advanced, Mr. Prentiss wrote:

"This seems very high, but our stock that we used to get for $125 per ton now costs $375, and tax, materials and labor—you know what they are."

The young manufacturer's feelings, when on Feb. 27, 1863, he wrote the following to a customer, may be imagined.

"Our stock has doubled in price, and some things we use now cost three times old prices. Where we are drifting to the Lord only knows. Sterling exchange now quoted at 190 per cent."

These autographed letters convey perhaps better than any other way an idea of the character and methods of the founder of the Prentiss business. They picture him in the period following his thirtieth birthday—a young man of high enterprise, forging ahead rapidly, yet with prudence; a careful student of his trade, shrewd in his dealing with his competitors, square with his customers and determined to build his young industry on a foundation of progressiveness and integrity. Naturally it grew rapidly in size and importance. His son and grandson, following after, have adhered to the tradition that dates from 70 years ago. Now, in the third generation, the business is modern in its facilities and methods and abreast of the times in metallurgical development and with a management that lives up to the founder's ideals.

Machine Tool Buying Hand-to-Mouth

Buying in Slack Times Not Stimulated by Low Prices—Must Show Large Return on Buyer's Investment—Obsolescence Rapid

IN a broad sense, the machine tool industry has always been on a hand-to-mouth basis, according to Ernest F. DuBrul, general manager National Machine Tool Builders' Association, Cincinnati. He sees no indications at present that point to a deviation from that method of doing business. This opinion was expressed at a conference on Hand-to-Mouth Buying, held at the Congress Hotel, Chicago, Feb. 17, under the auspices of the Policyholders' Service Bureau of the Metropolitan Life Insurance Co.

"It is seldom the case that a purchaser can be induced to order machinery on the sole argument that the time to buy is when costs are low, and when builders can make prompt deliveries and are willing to sacrifice profits to hold an organization together.

"Generally that argument will not coax a teaspoonful of business out of a man whose plant is not running quite up to capacity. Nearly all manufacturers buy machinery only if and when they think they will be able to use it promptly in producing goods at a profit. If that happens to be when business is dull in the equipment industries, a shrewd buyer can perhaps pick up some equipment bargains. But he is not buying because of low prices, but because of actual need of the machinery.

Buying Accompanies Activity in Other Lines

"If the people who buy a manufacturer's goods have the spurt habit of buying, then that manufacturer necessarily gets the spurt habit of buying the machines he needs to fill his spurt of orders. So, too, if merchants get into steadier buying habits, the manufacturers of all kinds of goods will steady their own habits of buying machinery. Whenever general business takes a booming spurt they come at the machine builders in droves, clamoring for deliveries. Then, at the first signs of slackening business, they drop out of the market, for the simple reason that their wants are temporarily satiated. So, with few exceptions, buyers of machinery are simon-pure, dyed-in-the-wool, hand-to-mouth buyers.

"No class of industry can be helped more than the equipment industries by stabilization of general buying. Industrial machines cannot safely be stocked in dull times, because a competitor may come out with a new and revolutionary design which simply turns all stocks of previous designs into scrap. So these industries have always had to go through the painful, wasteful and costly process of curtailing their labor forces when their demand fell off. This was always just about when the force had been painfully trained.

"Recent comparative stabilization of consumer-goods buying has had some marked effects on the machine tool industry. Instead of a fairly high demand following the big slump of 1921 and early 1922, the year 1923 brought only a little boomlet which did not reach much (if any) above 45 to 50 per cent of the industry's capacity. Then what was only a slight recession in 1924 for other industries was a fair slump in the machine tool field. Nineteen hundred twenty-five and 1926 pushed the industry's orders above the boom of 1923, making an average utilization of plant probably around 60 or 65 per cent of one-shift capacity.

"Since the present capacity is the result of a heavy war-time expansion, that would be a rather good pre-war business. Overburdened with this extra capacity, that it must carry for some years more, the industry has not been a happy hunting ground in which to get anything like the bag of profits that other industries have furnished.

Heavy Investment Return Demanded

"In the vain attempt to coax out enough business to utilize this large capacity, new designs are offered at prices which leave little profit to the builder, although the machines earn 100 to 400 per cent on their cost, each year, in the user's shop. Some tools better protected by patents, and sold by better merchandisers, are priced so high that they pay their users only 50 per cent annual dividends. Curiously, some users have come to refuse to buy machines that do not pay 100 per cent or more per year on the investment.

"Recent surveys of equipment in machine shops of all sorts have disclosed that a large number of machine tools are more than 10 years old. Many of these tools are in good running condition, because, to do good work when new, they had to be so well built that wearout is extremely slow. Physical life and economic life are quite different and unrelated.

Obsolescence Proceeds Apace

"Necessity to get business has again borne a fresh crop of new inventions and development in the machine tool industry. So many superior designs have been brought out in the last five years that mechanical experts agree that nearly every type of machine tool built up to 1921 is now definitely obsolete for fast production. As wide-awake users install the newer types, their less wide-awake competitors must either follow suit or sink into business oblivion.

"On this basis the machine tool industry has stepped out of the mire, and, while its profits have not been great, due to the burden of excess capacity, it at least has begun to share a little in the general prosperity which its designs have created for its customers. Relatively stable buying of machines will help us more than anything else we know of. This can be gained by us only after our customers' demand has been stabilized. So we are glad to do everything possible to urge business men in other industries to study this problem and learn how to cure the evils of irregularity that have cursed all business so long."

Non-Ferrous Developments Marked

Institute of Metals Holds Sessions on Zinc, Aluminum and Copper—Theory of Hardening Discussed —Innovation in Microscopic Technique

A STEADY gain is being made, year by year, in the attention given to the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, doubtless due to the continued excellence of the program sponsored by this group. At the last annual meeting, six well-attended technical sessions were held, Feb. 15, 16 and 17, in addition to the annual lecture, and the so-called "alumni dinner."

How the Institute Has Expanded

THE latter, which is the business meeting of the Institute of Metals, was held on Tuesday evening, Feb. 15, at the Fraternity Clubs Building, and taxed the capacity of the main dining room. It marked the twentieth anniversary of the organization. Originally an offshoot of the American Foundrymen's Association known as the Brass Foundrymen's Association, it maintained separate existence for some time, when the officers accepted an invitation to become a division of the American Institute of Mining Engineers, especially devoted to non-ferrous metallurgy. Reports read at the dinner indicate a marked revival in interest. Over 800 members are enrolled and regional meetings throughout the year are in prospect.

Since the beginning, a joint meeting has been held in the fall with the American Foundrymen's Association; but as this organization is to meet in the spring of 1927, a similar plan has been made for this year with the American Society for Steel Treating to cooperate with this society's annual meeting and exhibit to be held next September in Detroit. A committee, headed by R. S. Archer, is also engaged in the preparation of data sheets on metals and alloys other than iron for the A. S. S. T. handbook.

The present officers were reelected: Paul D. Merica, chairman; Zay Jeffries, vice-chairman; W. M. Corse, secretary-treasurer. The executive committee consists of R. S. Archer, J. R. Freeman, E. C. Bain, S. Skowronski, H. C. Jensen and L. W. Spring.

Annual Lecture Given by British Metallurgist

THE high grade of excellence, set by previous lecturers, was adequately maintained on Wednesday afternoon, Feb. 16, by the guest of the Institute, Prof. Cecil H. Desch, professor of metallurgy, University of Sheffield, Sheffield, England. He took as a subject "Growth of Metallic Crystals," a matter which has engaged his attention for many years, and upon which he has already reported to the Beilby Committee of the British Institute of Metals.

As the lecturer observed, the laws of crystalline growth must be understood in order to control not only the inner structure of ingots and castings, but also the physical properties of worked and heat-treated metals and alloys. It is one, however, which is very little understood, primarily because of the difficulty in experimenting at elevated temperatures, and of observing changes in the opaque melts. Consequently most of the information now available results from observations on solid metal, interpreted in the light of studies on transparent solutions or organic materials during the solidification range.

From such work Doctor Desch was able to present some data on the rate of formation and distribution of nuclei; the rate of growth of crystals and the reason for directional growth; the effect of impurities, both soluble and insoluble; and the reason why dendrites vary so much in shape (from the sharp ferns in antimony, to the rounded masses in bronze).

His lecture was well-illustrated by lantern slides, and held the attention of an audience which filled the main auditorium in the Engineers' Building. It is a discourse which cannot readily be abstracted, but will repay close study by foundrymen and metallurgists generally.

New Light on Crystallization of Zinc

THAT the matters discussed so ably by Doctor Desch have much more than academic interest may be judged from the papers presented at the session on zinc, Tuesday morning, Feb. 15, under the chairmanship of George C. Stone, of the New Jersey Zinc Co. Three separate papers dealing with the production of single crystals of zinc, and the behavior of these crystals under stress were read by O. E. Romig, of the American Sheet & Tin Plate Co., S. L. Hoyt, of the General Electric Co., and C. H. Mathewson and A. J. Phillips of Yale University.

Messrs. Romig and Hoyt both produced their specimens by drawing a thread of zinc out of a molten bath, and cooling it rapidly by a blast of hydrogen. The crystals so formed were several inches long, but less than 1/16 in. across the section. Some were brittle; others could be pulled out over 300 per cent before breaking. X-ray studies showed that in the former the basal planes of the crystal (along which slip occurs in plastic flow) are nearly at right angles to the stress, while in the ductile wires the basal planes are inclined at about 45 deg. to the extension. In the ductile specimens, plastic flow is associated with slips along a succession of basal planes, thus converting the wire into a series of flat crystalline blocks, each of which slightly rotates as it slips, in such a manner that one hexagonal axis of the fragment approaches the direction of stress.

(The same phenomenon occurring in aluminum wire was demonstrated by X-ray analysis in another paper by Profs. J. T. Norton and B. E. Warren of Massachusetts Institute of Technology.)

Traces of these slip planes appear as parallel striations a secondary series of straight markings, appearing in a greatly elongated specimen, suggests to Doctor Hoyt that even in this highly fragmented material "the virgin lattice remains undisturbed," at least in its grosser aspects. He finds no hypothesis on strain hardening which is compatible with this observation, and at the same time explains the 500 per cent elongation and 5000 per cent strengthening of the original crystal before it finally breaks.

Very Large Zinc Crystals Studied

Professors Mathewson and Phillips were able to work with very much larger zinc crystals, up to several square inches in cross section, secured by recrystallization of slightly worked plate. Some sizable perfect crystals were also secured by condensing zinc vapor. These specimens were large enough to study by crystallographic methods; actual measurements of the angles between faces established an axial ratio of 1.86 and other data which check exactly work done by others with X-ray analysis.

They report that it is impossible to strain these crystals beyond the elastic limit, without causing many twins to form in the metal. This action increases in complexity as the deformation increases. Furthermore, *all* cleavage takes place along the basal plane, where the atoms are most closely packed. The prismatic fractures described by Messrs. Romig and Hoyt are thought by Professor Mathewson to be merely basal cleavages in twinned metal (the divergence in these two planes

"This seems very high, but our stock that we used to get for $125 per ton now costs $375, and tax, materials and labor—you know what they are."

The young manufacturer's feelings, when on Feb. 27, 1863, he wrote the following to a customer, may be imagined.

"Our stock has doubled in price, and some things we use now cost three times old prices. Where we are drifting to the Lord only knows. Sterling exchange now quoted at 190 per cent."

These autographed letters convey perhaps better than any other way an idea of the character and methods of the founder of the Prentiss business. They picture him in the period following his thirtieth birthday—a young man of high enterprise, forging ahead rapidly, yet with prudence; a careful student of his trade, shrewd in his dealing with his competitors, square with his customers and determined to build his young industry on a foundation of progressiveness and integrity. Naturally it grew rapidly in size and importance. His son and grandson, following after, have adhered to the tradition that dates from 70 years ago. Now, in the third generation, the business is modern in its facilities and methods and abreast of the times in metallurgical development and with a management that lives up to the founder's ideals.

Machine Tool Buying Hand-to-Mouth

Buying in Slack Times Not Stimulated by Low Prices—Must Show Large Return on Buyer's Investment—Obsolescence Rapid

IN a broad sense, the machine tool industry has always been on a hand-to-mouth basis, according to Ernest F. DuBrul, general manager National Machine Tool Builders' Association, Cincinnati. He sees no indications at present that point to a deviation from that method of doing business. This opinion was expressed at a conference on Hand-to-Mouth Buying, held at the Congress Hotel, Chicago, Feb. 17, under the auspices of the Policyholders' Service Bureau of the Metropolitan Life Insurance Co.

"It is seldom the case that a purchaser can be induced to order machinery on the sole argument that the time to buy is when costs are low, and when builders can make prompt deliveries and are willing to sacrifice profits to hold an organization together.

"Generally that argument will not coax a teaspoonful of business out of a man whose plant is not running quite up to capacity. Nearly all manufacturers buy machinery only if and when they think they will be able to use it promptly in producing goods at a profit. If that happens to be when business is dull in the equipment industries, a shrewd buyer can perhaps pick up some equipment bargains. But he is not buying because of low prices, but because of actual need of the machinery.

Buying Accompanies Activity in Other Lines

"If the people who buy a manufacturer's goods have the spurt habit of buying, then that manufacturer necessarily gets the spurt habit of buying the machines he needs to fill his spurt of orders. So, too, if merchants get into steadier buying habits, the manufacturers of all kinds of goods will steady their own habits of buying machinery. Whenever general business takes a booming spurt they come at the machine builders in droves, clamoring for deliveries. Then, at the first signs of slackening business, they drop out of the market, for the simple reason that their wants are temporarily satiated. So, with few exceptions, buyers of machinery are simon-pure, dyed-in-the-wool, hand-to-mouth buyers.

"No class of industry can be helped more than the equipment industries by stabilization of general buying. Industrial machines cannot safely be stocked in dull times, because a competitor may come out with a new and revolutionary design which simply turns all stocks of previous designs into scrap. So these industries have always had to go through the painful, wasteful and costly process of curtailing their labor forces when their demand fell off. This was always just about when the force had been painfully trained.

"Recent comparative stabilization of consumer-goods buying has had some marked effects on the machine tool industry. Instead of a fairly high demand following the big slump of 1921 and early 1922, the year 1923 brought only a little boomlet which did not reach much (if any) above 45 to 50 per cent of the industry's capacity. Then what was only a slight recession in 1924 for other industries was a fair slump in the machine tool field. Nineteen hundred twenty-five and 1926 pushed the industry's orders above the boom of 1923, making an average utilization of plant probably around 60 or 65 per cent of one-shift capacity.

"Since the present capacity is the result of a heavy war-time expansion, that would be a rather good pre-war business. Overburdened with this extra capacity, that it must carry for some years more, the industry has not been a happy hunting ground in which to get anything like the bag of profits that other industries have furnished.

Heavy Investment Return Demanded

"In the vain attempt to coax out enough business to utilize this large capacity, new designs are offered at prices which leave little profit to the builder, although the machines earn 100 to 400 per cent on their cost, each year, in the user's shop. Some tools better protected by patents, and sold by better merchandisers, are priced so high that they pay their users only 50 per cent annual dividends. Curiously, some users have come to refuse to buy machines that do not pay 100 per cent or more per year on the investment.

"Recent surveys of equipment in machine shops of all sorts have disclosed that a large number of machine tools are more than 10 years old. Many of these tools are in good running condition, because, to do good work when new, they had to be so well built that wearout is extremely slow. Physical life and economic life are quite different and unrelated.

Obsolescence Proceeds Apace

"Necessity to get business has again borne a fresh crop of new inventions and development in the machine tool industry. So many superior designs have been brought out in the last five years that mechanical experts agree that nearly every type of machine tool built up to 1921 is now definitely obsolete for fast production. As wide-awake users install the newer types, their less wide-awake competitors must either follow suit or sink into business oblivion.

"On this basis the machine tool industry has stepped out of the mire, and, while its profits have not been great, due to the burden of excess capacity, it at least has begun to share a little in the general prosperity which its designs have created for its customers. Relatively stable buying of machines will help us more than anything else we know of. This can be gained by us only after our customers' demand has been stabilized. So we are glad to do everything possible to urge business men in other industries to study this problem and learn how to cure the evils of irregularity that have cursed all business so long."

Non-Ferrous Developments Marked

Institute of Metals Holds Sessions on Zinc, Aluminum and Copper—Theory of Hardening Discussed —Innovation in Microscopic Technique

A STEADY gain is being made, year by year, in the attention given to the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, doubtless due to the continued excellence of the program sponsored by this group. At the last annual meeting, six well-attended technical sessions were held, Feb. 15, 16 and 17, in addition to the annual lecture, and the so-called "alumni dinner."

How the Institute Has Expanded

THE latter, which is the business meeting of the Institute of Metals, was held on Tuesday evening, Feb. 15, at the Fraternity Clubs Building, and taxed the capacity of the main dining room. It marked the twentieth anniversary of the organization. Originally an offshoot of the American Foundrymen's Association known as the Brass Foundrymen's Association, it maintained separate existence for some time, when the officers accepted an invitation to become a division of the American Institute of Mining Engineers, especially devoted to non-ferrous metallurgy. Reports read at the dinner indicate a marked revival in interest. Over 800 members are enrolled and regional meetings throughout the year are in prospect.

Since the beginning, a joint meeting has been held in the fall with the American Foundrymen's Association; but as this organization is to meet in the spring of 1927, a similar plan has been made for this year with the American Society for Steel Treating to cooperate with this society's annual meeting and exhibit to be held next September in Detroit. A committee, headed by R. S. Archer, is also engaged in the preparation of data sheets on metals and alloys other than iron for the A. S. S. T. handbook.

The present officers were reelected: Paul D. Merica, chairman; Zay Jeffries, vice-chairman; W. M. Corse, secretary-treasurer. The executive committee consists of R. S. Archer, J. R. Freeman, E. C. Bain, S. Skowronski, H. C. Jensen and L. W. Spring.

Annual Lecture Given by British Metallurgist

THE high grade of excellence, set by previous lecturers, was adequately maintained on Wednesday afternoon, Feb. 16, by the guest of the Institute, Prof. Cecil H. Desch, professor of metallurgy, University of Sheffield, Sheffield, England. He took as a subject "Growth of Metallic Crystals," a matter which has engaged his attention for many years, and upon which he has already reported to the Beilby Committee of the British Institute of Metals.

As the lecturer observed, the laws of crystalline growth must be understood in order to control not only the inner structure of ingots and castings, but also the physical properties of worked and heat-treated metals and alloys. It is one, however, which is very little understood, primarily because of the difficulty in experimenting at elevated temperatures, and of observing changes in the opaque melts. Consequently most of the information now available results from observations on solid metal, interpreted in the light of studies on transparent solutions or organic materials during the solidification range.

From such work Doctor Desch was able to present some data on the rate of formation and distribution of nuclei; the rate of growth of crystals and the reason for directional growth; the effect of impurities, both soluble and insoluble; and the reason why dendrites vary so much in shape (from the sharp ferns in antimony, to the rounded masses in bronze).

His lecture was well-illustrated by lantern slides, and held the attention of an audience which filled the main auditorium in the Engineers' Building. It is a discourse which cannot readily be abstracted, but will repay close study by foundrymen and metallurgists generally.

New Light on Crystallization of Zinc

THAT the matters discussed so ably by Doctor Desch have much more than academic interest may be judged from the papers presented at the session on zinc, Tuesday morning, Feb. 15, under the chairmanship of George C. Stone, of the New Jersey Zinc Co. Three separate papers dealing with the production of single crystals of zinc, and the behavior of these crystals under stress were read by O. E. Romig, of the American Sheet & Tin Plate Co., S. L. Hoyt, of the General Electric Co., and C. H. Mathewson and A. J. Phillips of Yale University.

Messrs. Romig and Hoyt both produced their specimens by drawing a thread of zinc out of a molten bath, and cooling it rapidly by a blast of hydrogen. The crystals so formed were several inches long, but less than 1/16 in. across the section. Some were brittle; others could be pulled out over 300 per cent before breaking. X-ray studies showed that in the former the basal planes of the crystal (along which slip occurs in plastic flow) are nearly at right angles to the stress, while in the ductile wires the basal planes are inclined at about 45 deg. to the extension. In the ductile specimens, plastic flow is associated with slips along a succession of basal planes, thus converting the wire into a series of flat crystalline blocks, each of which slightly rotates as it slips, in such a manner that one hexagonal axis of the fragment approaches the direction of stress.

(The same phenomenon occurring in aluminum wire was demonstrated by X-ray analysis in another paper by Profs. J. T. Norton and B. E. Warren of Massachusetts Institute of Technology.)

Traces of these slip planes appear as parallel striations a secondary series of straight markings, appearing in a greatly elongated specimen, suggests to Doctor Hoyt that even in this highly fragmented material "the virgin lattice remains undisturbed," at least in its grosser aspects. He finds no hypothesis on strain hardening which is compatible with this observation, and at the same time explains the 500 per cent elongation and 5000 per cent strengthening of the original crystal before it finally breaks.

Very Large Zinc Crystals Studied

Professors Mathewson and Phillips were able to work with very much larger zinc crystals, up to several square inches in cross section, secured by recrystallization of slightly worked plate. Some sizable perfect crystals were also secured by condensing zinc vapor. These specimens were large enough to study by crystallographic methods; actual measurements of the angles between faces established an axial ratio of 1.86 and other data which check exactly work done by others with X-ray analysis.

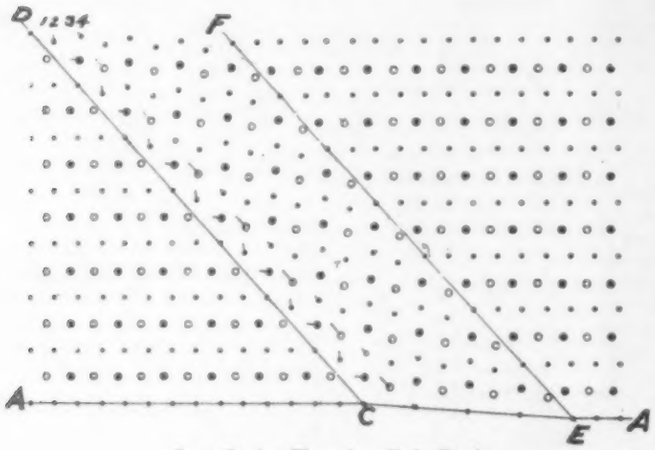
They report that it is impossible to strain these crystals beyond the elastic limit, without causing many twins to form in the metal. This action increases in complexity as the deformation increases. Furthermore, *all* cleavage takes place along the basal plane, where the atoms are most closely packed. The prismatic fractures described by Messrs. Romig and Hoyt are thought by Professor Mathewson to be merely basal cleavages in twinned metal (the divergence in these two planes

being only 4 degrees, much less than can be measured on the very small wire specimens).

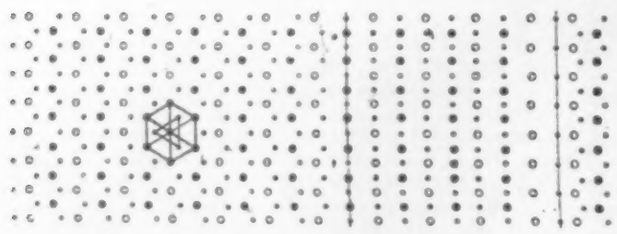
An interesting diagram, reproduced herewith (Fig. 52) shows how a region of twinned metal can form by appropriate but minute movements in individual atoms. The universal appearance of twins in metallic zinc and zinc alloys, and the ease with which they form, suggests that slip along basal planes during plastic deformation causes twinning along these planes, thus introducing a large increase in resistance to further slip along that plane. Likewise the essential crystallinity of the mass is unchanged.

New Developments in Copper and Its Alloys

MISS FRANCES H. CLARK, of the Western Union Laboratories, New York, presented two papers on



Cross Section Through a Twin Band



Plan View at A-A

Possible Structural Relationship Between Twin Band and Parent Crystal. (Fig. 52 in original paper)

60:40 brass. Miss Clark's lucid and confident presentation of her subject was especially noteworthy, reaching a degree of excellence rarely encountered in technical and engineering meetings.

This brass (60:40) at 825 deg. C. is a uniform solid solution of beta brass (body centered cubic lattice). Rapid quenching in iced brine gives polyhedral grains. On being reheated to 200 deg. C. this is converted into a fine sorbitic structure and the alpha constituent increases in grain size on higher annealing. At 470 deg. C. twins suddenly form in the alpha grains. On higher anneals, some of this alpha is absorbed into the beta crystals. The drastic quench is supposed to strain the material enough to produce the twins in the alpha crystals; the beta, however, is uninfluenced even by cold working after quenching.

Professor Mathewson advanced the opinion that microscopic changes in beta brass are not often seen because the reagents used to develop the alpha structure do not etch the beta satisfactorily. He showed some views of 53.47 brass (all beta) which revealed the usual crystallographic changes varying with the amount of work and the temperature of the anneal.

Miss Clark described experiments in which she examined polished surfaces during recrystallization of the underlying metal. No outer change was observable. A slight etching brought out the new structure. Further change in structure under this etched surface caused no change in outer appearance until the specimen was re-etched.

Evidently, the recrystallizing forces are not strong enough to affect the surface layers of atoms.

Beryllium-Copper Alloys Interesting

W. H. BASSETT of the American Brass Co., Waterbury, Conn., described some mill tests with beryllium-copper alloys. The principal physical properties are noted in the diagram (Fig. 2).

With less than 1.65 per cent beryllium (which forms an alpha solid solution with copper) the alloys hot-rolled well and were readily finished by cold-drawing (75 per cent) into wire of various sizes. With care, alloys, containing up to 2.35 per cent Be were successfully rolled when hot (alpha plus beta complex). When cold these alloys transform to alpha plus gamma and are more malleable; 3½ per cent Be alloys could be handled commercially if specially strong rolls were used. Cold rolled sheets with 3 per cent Be, reduced 18 per cent, leave a Brinell hardness of nearly 300.

Wire having 1.62 per cent Be withstands the kink test and bends through an angle of 165 deg. in the flat-back test. It will be valuable as a high strength conductor; compare it with the best tin-silicon alloy having a tensile strength of 117,000 lb. and a conductivity of 15.5 per cent.

Beryllium-copper alloys will be as resistant to corrosion as pure copper, but not more so. With beryllium metal at present prices, its alloys might be used for springs, wires, and high-strength conductors.

Deoxidized Copper

Tube makers have long recognized the superiority of specially deoxidized copper. In making small sizes of seamless copper tube, such as are consumed in quantity by the household refrigerator industry, it can be cold drawn to 90 per cent reduction in four runs without annealing. It is also superior in its welding qualities. Quantitative measures of this superiority (such as are used to control cold-working mill operations) are given in a paper entitled "Some Comparative Properties of Tough Pitch and Phosphorized Copper," by W. R. Webster, J. L. Christie, and R. S. Pratt of the Bridgeport Brass Co., Bridgeport, Conn.

While the material did not contain enough phosphorus to completely deoxidize it, it contained only one third the oxygen of the tough pitch samples. Mr. Webster said that complete deoxidization would only enhance the differences.

The temperature of initial softening is 75 to 100 deg. higher than tough pitch, an important factor in the tinning operation. Tensile strength and elongation are practically identical. Contraction in area of the phosphorized copper is considerably higher —which permits more cold work between anneals. Tough pitch copper does not scale as readily as phosphorized.

Hardened Copper Now Available

M. G. CORSON described his method of hardening copper with silicides of nickel or cobalt—a matter which has already been presented at length in the columns of THE IRON AGE, Feb. 10, 1926. An X-ray study of these alloys has been made by E. C. Bain of the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., in which he finds the general phenomena similar to those in quenching and tempering steel, duralumin, and lead-antimony-calcium.

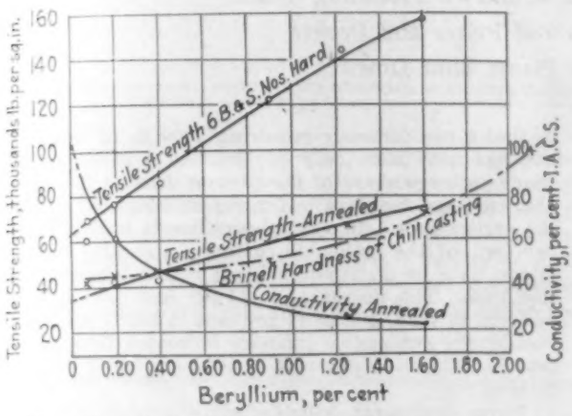
Quenched alloys exhibit perfect crystallinity of a true austenite—all cobalt, nickel and silicon being in solid solution with no measurable distortion of the normal copper space lattice. Drawing to maximum hardness completely changes the character of the X-ray diffraction lines, indicating new atomic spacings of variable magnitude even in one grain, and a notable absence of continuity in the crystallographic planes. This corresponds to a martensite. Complete annealing restores the crystalline perfection in large measure. So little silicide

is present that its characteristic X-ray lines were not found in these films.

Recent Work on Aluminum Alloys

A SERIES of studies on pure aluminum, alloyed with other metals, are being made by E. H. Dix, Jr., and W. D. Keith of the Aluminum Co. of America. The diagram presented herewith shows their work on the aluminum-manganese system. (Fig. 4).

Wrought aluminum (1¼ per cent Mn) is much used


Tensile Strength, thousands lb. per sq.in.
Conductivity, per cent-I.A.C.S.
Tensile Strength 6 B & S. Nos. Hard
Tensile Strength-Annealed
Brinell Hardness of Chill Casting
Conductivity Annealed
Beryllium, per cent
0 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
20 40 60 80 100 120 140 160

Strength and Conductivity of Copper-Beryllium Alloy Wire of 0.125 In. Diameter; Beryllium, 0 to 1.6 Per Cent (Fig. 2 in Original Paper)

for cooking utensils, rods, tubes and pipes. Alloys, with 1 to 2 per cent manganese, both cast and wrought, are used by the United States Naval gun factory to resist corrosion attack. Manganese is also an essential element of some duralumins.

Even though the limit of solubility is shown to be 0.65 per cent manganese, chill castings containing as much as 2 per cent manganese show very little of the manganese compound under the microscope. Extended annealing at 500 deg. C. brings out an eutectic structure. Since the hardness of the alloy remains unchanged during the process, the authors explain the observed facts by assuming the casting to consist of eutectic particles so fine as to be unseen under the microscope. Annealing allows coalescence to visible size. They suggest that the word "dispersoid" characterizes the true nature of the particles better than the word "precipitated."

C. B. Sodtler and J. L. Gregg ("Deformation of an Aluminum Alloy by Constant Load") gave some figures which showed progressive stretching in duralumin-test pieces under long continued load at room temperature. R. L. Templin, Aluminum Co. of America, New Kensington, Pa., said he had observed similar effects until he took special care to prevent small vibrations in the testing machine; whereupon no further elongation was observed under loads suspended for weeks.

"Still Casting" Practice Suggested

Aluminum, and even alloys containing a fractional percentage of aluminum, produce distinctive surface films when molten. This is utilized by P. H. G. Durville, consulting metallurgist of Paris, France, in a system of "still-casting" (coulee tranquille).

He notes that the skimmings on aluminum alloys are strong and tough, insoluble in the underlying metal, and therefore protect it from oxidation from the outer air, and from loss of zinc or other volatile metals from within. Since the film forms almost instantly on exposure, it is desirable to cast such alloys from *under* the skin, so the insoluble oxides will not be trapped in the solid casting, and to preserve the alloy from further loss of metal.

Three methods are available. Die casting and tilting molding are both well known in America—the latter being used in several modifications for ingot pouring. The third process of bottom casting is new, although it is said to be quite successful in France and England.

It consists of pouring the casting through a horn gate leading outside of the mold proper. When casting is started, the gate is very low or only sufficient to fill the bottom few inches of the main casting. The ladle is held close to this gate so that the hot metal has a minimum fall. As casting proceeds, the gate is built up to keep ahead of the rising pool of metal by means of sand-lined rings, split to be assembled without interrupting the flow of metal. Each gate section is keyed on for stability.

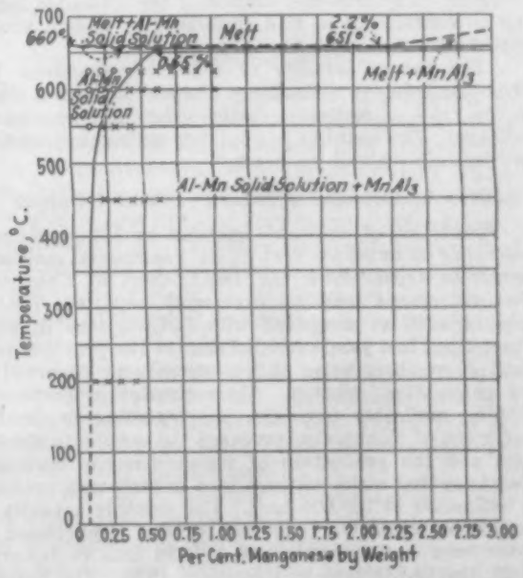
Views Offered on Hardening Theory

WHILE the mechanism of plastic deformation is quite well understood, no satisfactory explanation has yet been advanced concerning the nature of the contact surfaces between crystals and crystalline fragments. R. S. Dean and J. L. Gregg, of the Western Electric Co., attacked this problem in the light of electrical data in a paper, "General Theory of Metallic Hardening."

In the normal crystal lattice, they believe that some of the electrons in the outer atomic shells are relatively free, and go to form the general negative field of the metal. If the atoms are separated somewhat (as occurs at crystal boundaries, and on slip planes), but not enough to form an active discontinuity, the separated atoms will take on electrons and some pairs will therefore share the same electrons. "This is in effect a forced molecule formation, and it is to these pseudo-molecules that grain boundaries owe their special properties."

New Microscopic Technique Made Public

ANOTHER unconventional innovation in microscopic technique has been made by Francis F. Lucas of the Bell Telephone Laboratories, New York. He was confronted with several problems concerning lead antimony (1 per cent Sb) cable sheaths, and found that the



Modified Diagram of the Aluminum End of the Al-Mn System

ordinary methods of polishing and etching gave very unsatisfactory fields for observation, notwithstanding quite laborious and time-consuming manipulations. It occurred to him that many of these difficulties could be avoided if a plane surface could be cut with a sharp knife.

Consequently he secured a substantial microtome, designed to cut wood sections for examination. Very careful honing of the knife blade is necessary, to free it of all nicks and feather edges. When it is good enough to cut a coherent section in lead two microns in thickness, it will leave the underlying block sufficiently free of scratches and surface work so that very slight etching will reveal the true structure of the metal. By this

means a specimen may be prepared in three minutes, sufficiently good to yield perfect photographs at 2500 diameters.

Lead and its various alloys, tin, platinum, gold and silver may be cut on a Jung microtome. Aluminum and its alloys, copper, zinc, brasses and bronzes are a little too hard. Pending the development of a better knife, sections on these harder metals may be cut and then finished with a magnesium oxide lap, thus saving considerable polishing time.

Production of Malleable Castings 1,000,000 Tons

Output in 1926 About on a Par with Two Preceding Years, But Competition Is Keen and Prices and Profits Have Suffered—Some Plants Shut Down

PRODUCTION of malleable castings in the United States in 1926 was approximately 1,000,000 tons, or about the same as in 1924 and 1925. In 1923 the production was about 5 per cent greater than last year. The better output during that year is attributed to the large amount of railroad car building as well as to the fact that in 1923 production was high in the automotive industry.

The 1926 production indicates that the malleable industry is holding its own from the standpoint of production. From the standpoint of profits the picture of the present condition of the industry is not so pleasing. However, in this respect probably it is no worse off than quite a few other industries in the metal working field. Malleable foundries, like most other industries, expanded materially during the war-time period and the effects of this expansion are still being felt in a productive capacity greater than the normal demands. The competitive conditions resulting have tended to bring prices down to levels which leave little or no margin for profit. Many malleable foundries, it is claimed, cannot produce castings for the prices they are now bringing. The present condition of the malleable industry is summed up in this statement by a man prominently identified with the industry.

"The excess capacity of malleable foundries has given the industry a black eye. There has been a slump in the price of malleable castings, but no slump in the tonnage. The tonnage is good but malleable foundries are making little or no profit."

Drop in Automotive Industry Affected Output

Production of malleable castings by 139 plants representing 80 to 85 per cent of the commercial malleable foundries from which the Department of Commerce obtains reports was, as previously reported, 728,930 tons in 1926 as compared with 737,532 tons in 1925. The output last year exceeded that of the previous year until November, when sharp curtailment occurred in the automotive industry. The estimated production of jobbing malleable foundries not reporting to the Department of Commerce increased the output to 850,000 tons and the production of non-commercial malleable foundries that make castings used in their own products is estimated at 150,000 tons. The monthly capacity of malleable foundries reporting to the Department of Commerce was reduced from 114,198 tons in January, 1925, to 103,831 tons in December, 1926. The reduced capacity has been brought about by foundries being either permanently abandoned or shut down for an indefinite period. Those in the latter class probably will resume operations when conditions warrant, making some increase in the last reported capacity. Of the total capacity figured on the basis indicated above 55.7 per cent was operated in 1926 as compared with 54.04 per cent in 1925. This is not regarded as a bad showing, taking into consideration that a few years ago when the industry was striving for maximum production it was operating at only 75 per cent of normal capacity.

The only severe setback from the standpoint of tonnage that the malleable industry admits having suffered resulted from the adoption a few years ago of the one-piece steel side frame for freight cars. This eliminated several malleable castings in the construction of a car, so that a car formerly requiring 2000 lb. of malleable castings now takes only 600 lb. As a result of this change a large share of the present demand for malleable castings for cars is for replacements on cars of the earlier type. In 1921 the railroads used 50 to 55 per cent of the malleable castings, according to estimates, data on distribution being rather incomplete at that time. This decreased to 24 per cent in 1924, to 20 per cent in 1925, and to 19 per cent in 1926. Consumption by the automotive industry increased from 38 per cent in 1924 to 40 per cent in 1925 and to 41 per cent in 1926.

Farm implement manufacturers used 8, 9 and 10 per cent of the malleable castings in the three years, respectively, and all other industries used 30, 31 and 30 per cent in the same three-year period. The average amount of castings in an automobile was 155 lb. in 1925 and 158 lb. in 1926. While there has been some shifting from malleable castings to parts made of other materials in the automotive and other industries, it is claimed that malleable castings have replaced steel castings and forgings in more cases than the latter products have replaced malleable castings. One of the more recent developments in the malleable field is the manufacture of a hollow spoke malleable iron wheel for the automotive industry. This is being used on motor buses and trucks and to some extent on passenger cars.

A large Central Western malleable foundry has discontinued operations with the announcement that it will not resume until it can sell its product at a profit and other foundries have been shut down to await an improvement in the demand. A few not so strong financially seem to have been forced out of business. The closing down of quite a number of malleable foundries will reduce the production capacity to nearer the demands of consumers and may lead to less keen competition, better prices and a general improvement.

Malleable Castings Tonnage Improves

Slightly higher production of malleable castings is reported by the Department of Commerce for January, as compared with the two preceding months. The output of 50,785 tons, however, was smaller than for any of the first 10 months of 1926. It compares with 75,658 tons in January and with 50,017 tons in December. Shipments, at 48,174 tons, were higher than in November and December, but lower than in the preceding months of 1926. Orders booked during the month, with a few plants missing from the reports, aggregated 49,776 tons. This is the highest figure since July and, with that exception, the highest since April.

Operation during January was at 48.1 per cent of the 105,669 tons monthly capacity. Five plants were idle, while 134 of the 139 identical plants which have reported for many months made castings during the month.

The American Hardware Manufacturers Association will hold its spring meeting at Memphis, Tenn., on May 10 to 14, inclusive, in conjunction with the meeting of the Southern Hardware Jobbers Association.

Use of Power in American Steel Mills

Furnace Gas for Boilers, Pulverized Fuel and Interconnection with Central Stations—Purchase of Power for Isolated Plant

BY W. SYKES

THIS is a portion of a paper read Feb. 16 before the Mid-West Power Conference at the Coliseum, Chicago. The conference was sponsored by local sections and regional and professional divisions of the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the National Electric Light Association, the Western Society of Engineers and the National Safety Council. Papers on the use of power in a half-dozen varying industries, and on other topics connected with power, were read. The author is consulting engineer Inland Steel Co., Indiana Harbor, Ind.

CERTAIN facts regarding the steel industry show its importance in the economic structure of the country. In 1926 the United States produced in excess of 39,000,000 tons of pig iron, the total world production being approximately 76,000,000 tons. Production of steel ingots and castings in the United States was over 48,000,000 tons, out of a world production of 91,000,000 tons. A comparatively small amount was exported, so it is obvious that domestic consumption per head of population is many times in excess of that of other countries.

Consumption of steel per head in 1900 was approximately 360 lb.; in 1926 it was 930 lb. The figure has been increasing continually, so that total requirements are growing faster than our population and there is no indication of any limit. [For the remainder of the world, with a population of 1,700,000,000, a consumption of 44,000,000 tons of steel represents only 62 lb. per head, or one-fifteenth that of the United States.]

Approximately 470,000 persons are employed in the steel industry. The amount paid annually in wages and salaries is between $850,000,000 or $900,000,000.

Improvements in Unit Output

With only a small fraction of the number of men employed around a blast furnace, compared with the middle of the nineteenth century, we produce 700 to 800 tons of pig iron per day against 25 to 50 tons, and at a much lower unit cost. Wages have probably quadrupled and supplies, instead of being obtained close to the furnace, are now brought hundreds of miles by boat and rail.

To counteract the great rise in cost which would have resulted from increasing wage rates and reduction in working hours during the past few years, it has been necessary to substitute machinery for manual operations and to speed up existing units by various means, all requiring more power. While no reliable statistics are available, figures of one plant indicate an increase in production per man of about 35 per cent within the last 10 years, in spite of the elimination of the 12-hr. day.

In contrast with our practice, European plants are not so completely equipped with labor-saving devices. As a result, in a number of German plants, which can be considered typical, the production per man is only about 40 per cent of what we obtain, and I am of the opinion that the men work just as hard.

It is estimated that the total amount of power used in the industry in 1926 was equivalent to about 7,000,000,000 kwhr. Approximately 75 per cent of the power was generated in the mills and about 25 per cent was supplied from outside sources, largely from central station plants. The approximate rating of motors used in steel mills aggregates 3,500,000 hp. and of this large total somewhat over 1,000,000 hp. is driven by purchased power.

Future Development

The present tendency regarding development of power in steel mills depends upon the type of plant. In those plants with blast furnaces, it is believed that the future practice will be to install efficient steam-driven turbo-blowers and turbo-generators. Boiler plants will be developed to burn surplus blast furnace gas economically and provision for supplementary fuel will be frequently installed where low-grade fuel is a by-product in the plant, as, for instance, coke braise. However, it will usually be found to be more satisfactory to burn solid fuels independently of the blast furnace gas, unless they are first pulverized. In some cases, where blast furnace gas is insufficient to supply the total power needs, pulverized coal will be used advantageously with the same boiler settings that are suitable for blast furnace gas.

There will be a tendency to inter-connect these plants with central station plants, so that, when excess power is available, it can be delivered to the central station and the fuel value of the excess gas will be rendered available. At other times, when the available gas is insufficient for the plant's power needs, power will be purchased from the central station. This is an important factor for central stations and steel plants to consider, and undoubtedly it can be worked out to the economic advantage of both.

In the case of steel plants not having blast furnaces, and located where central station power is available, it is believed that power can be purchased to advantage, instead of installing an individual power plant. This has been demonstrated in many cases and it is doubtful if any plant of this nature being built today will consider the investment of money in a power plant of its own if central station power is available at reasonable cost. The steel plant is justified in installing a generating plant only if it thereby uses fuel that would be otherwise wasted.

Rearranging a Brass Foundry

Large Increase in Capacity from New Layout, Including Conveying and Sand-Handling Equipment

FOR a number of years the Kennedy Valve Mfg. Co., Elmira, N. Y., has operated a two-story brass foundry. As originally laid out, the sand from the molds was shaken out through chutes to the first floor, where it was hand-tempered, and returned up an elevator to bins adjacent to most of the molding machines. A portion of the sand, however, had to be wheeled to molding machines distant from the center of the room. The molds were set on the floor and poured from small cranes.

It became necessary to increase the output greatly. As it was not desired to spend a large sum on additional buildings, the plan described in this article was evolved. The general layout of the handling plan was made by the H. M. Lane Co., Detroit, and the conveying and sand-handling equipment was furnished by the R. W. McIlvaine Co., Chicago.

To avoid cutting through the existing concrete floor, and also to provide for an extension of the building in the future and for a jobbing brass molding floor, a two-story addition 40 ft. in length was put on the end of the building. The first 20 ft. of this served mainly as a sand-handling unit and the other 20 ft. as a jobbing floor. Provision has been made to carry this extension to something over 100 ft. when additional molding and melting capacity is required.

The molding scheme is worked out as follows: Fig. 1 shows the arrangement at the molding machine side of the building. These molding machines are supplied with sand from an overhead bin, the sand dropping directly into the molds through a small hopper or chute. Adjacent to each molding machine are a set-off bench and several shelves for cores. The illustration happens to have been taken at a time when the flasks were all piled in the molding space and for this reason is somewhat misleading.

Back of the molding machines is a gangway for the delivery of cores and overhead can be seen the runway for the belt which delivers sand to the bins.

Fig. 2—Mold Carriers with Suspended Flask Weights Above Them

In front of each molding machine are three lines of gravity carriers, the ends of which terminate at different points, so that the molder can easily put on or take off molds. The two outer lines are for molds and are horizontal. The central line, for returning flasks, is inclined, so that the flasks return by gravity.

Unusual Method of Handling Flask Weights from Overhead

In Fig. 2 one looks between two mold carriers toward the molding machines. In this illustration the return flask carriers are partly hidden by the hanging flask weights. This scheme of weighting, worked out by the Kennedy engineering staff, consists of an overhead trolley from which weights are hung by bars and cam toggles.

After the molds are ready in place for pouring, the weights are adjusted over them and lowered on to them by a lever which controls the cam. As soon as the molds are poured the weights are picked up by the lever. They can be shoved back along the trolley, for pouring more molds, or can be left suspended while the molds are pushed to the shake-out end of the carrier.

Fig. 1—Arrangement of Molding Machines, Set-Off Benches, Sand-Handling Equipment and Mold and Empty Flask Carriers

Fig. 3 shows the shake-out end. As it was desirable to avoid cutting a trench, or a series of holes, in the floor, a specially designed carrier of the reciprocating shovel type was installed. This carrier takes up only 16 in. in height and passes under the shake-outs to the sand-handling unit.

When shaking out, the men pull the flasks from the end of the gravity carrier on to the shake-out grating shown. The sand passes through to the reciprocating conveyor, while the flasks are piled on the inclined flask return carrier. The castings are thrown into boxes on the gravity carrier shown at the left. This passes down to the end of the plant, where there is an opening in the floor through which the boxes are sent down a chute to the cleaning room below.

A portion of the hot-metal delivery system can be seen in Fig. 3. It consists of a main line of monorail track with a series of switches by means of which the pouring crucibles are transferred to cranes. These can be lined up with the flasks on the mold carriers. The metal is melted in ten 350-lb. Detroit electric furnaces.

Fig. 3—Shake-Out Unit Arranged Above Existing Foundry Floor

Reversing Blooming Mill Practice

Considerations of Rolling Phenomena—Rolling Temperatures—Work Done in Compressing the Metal—Wedge-Shaped Internal Prisms

BY GEORGE A. V. RUSSELL*

PROGRESS of late years in blooming mill design and practice has been characterized by a steady evolutionary growth, rather than by the production of startling innovations. Nevertheless, for productive capacity, economy in operation, and reliability a plant of today is as much superior to that of 15 years ago as was the latter to the early installations. The demand for rolled-steel products created by the late war stimulated improvements in construction and operation to a considerable extent, so that the normal rate of development was accelerated.

Many valuable but widely scattered articles and papers have appeared in the technical literature of different countries, dealing with various aspects of the subject. But the author has not come across a general résumé of current practice in this branch of rolling mill work.

Rolling Process

SEVERAL conflicting theories have been advanced in explanation of what takes place in rolling. Some have been based on experiments with rolling mills, some on observations of the deformation occurring in other less complex hot-working processes, and others on reasoning founded on the laws of deformation of plastic bodies.

Phenomena observable when rolling exclusively or principally by direct pressure, with almost complete absence of lateral restraint on the piece, will be considered. This is the condition which generally obtains in cogging practice. The early experimental work of Kick, Hollenberg and Blass provides substantial evidence for believing that the rolling process is essentially compressive in character. More recent investigations into rolling and forging phenomena have brought to light nothing to refute this view.

Formation of Wedge-Shaped Prisms

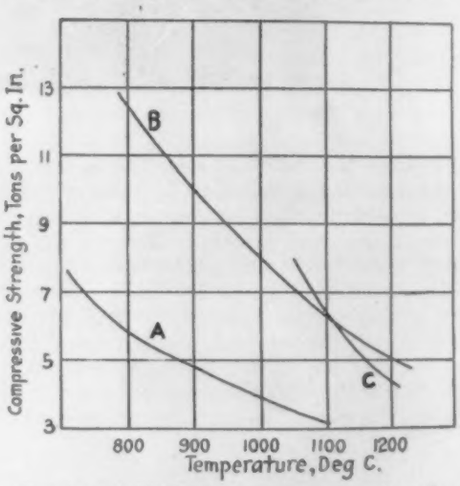
These researches in general confirm what Professor Kick was the first to point out, namely, that wedge-shaped prisms are formed under the areas of contact between the piece and the rolls, and the material which at any moment forms these prisms does not at that instant undergo any deformation, but simply transmits the pressure impressed upon it to the adjacent regions of the piece. The formation of these prisms is no doubt due to the frictional restraint exercised on the piece by surface contact with the area of contact of the rolls and also, to a less extent, as shown by H. F. Massey, for the case of forging, to the surface-cooling effect of the rolls, increasing the rigidity of the layer immediately in contact with them.

Succeeding layers of material will be influenced to a smaller degree by these factors, hence the area affected at increasing distances from the surface of contact will diminish progressively. The result is that the immobile volume will be contained in an envelope of trapezoidal wedge-shaped form whose base is the contact surface. The rate of diminution of area of the successive layers of such a prism will obviously be governed by the internal friction of the material; the greater this is the deeper will the wedge go, and the greater will be the included angle between its bounding surfaces and the tangent plane of the arc of contact.

As has been said, these friction prisms transmit the impressed pressure to the material in adjacent regions in the piece, and it follows that, since they are not deformed, the pressure exerted by them on a layer of the surrounding material at any distance from the contact surface will vary inversely as their area at that distance. Such occurrences as the variations in spread and "lead" observable when rolling thick and thin pieces, and when taking heavy and light drafts, become explicable on this hypothesis. If this hypothesis be correct, the true compressive strength of the material provides the measure of its resistance to deformation in rolling.

Hot Compression Tests Plotted

Compression tests of steel at high temperatures have received scant attention at the hands of experimenters. If Riedel's tests be excepted, no results of value have been published. In Fig. 1 some of Riedel's results are plotted. Curve A was obtained from tests on relatively long cylinders. Curve B, which may be termed the true compressive strength curve, was obtained from the compression of double-cone or diabolo-shaped test pieces with an angle of 76 deg. 50 min. between the frustra of the two cones forming the piece, it having been found that such test pieces undergo no change in shape on compression. Curve C is plotted from figures calculated by G. M. Brown from a number of rolling-mill tests in which the draft was comparatively small.



Results of High-Temperature Compression Tests of Mild Steel

Dr. Dupuy's recently published results for the tensile properties of steels of varying carbon content confirm the belief generally held that there is practically no difference in the mechanical properties of all carbon steels at a given high temperature. On account of the greater fusibility of the higher-carbon steels, they are necessarily worked commercially at somewhat lower temperatures, so that the energy consumption for unit deformation is higher. Some investigations on the high-temperature properties of those alloy steels of which relatively heavy tonnages are now produced would be of value.

Work Done in Rolling Steel

For estimating the work done in rolling it is most convenient to consider the deformation undergone by the piece. When a block of plastic material of area

*Manager of Engineering Department, Brightside Foundry & Engineering Co., Sheffield, England. The article is taken from his paper read Dec. 16 before the American Society of Mechanical Engineers, at a local meeting in Cleveland. •Other portions of the paper, devoted to specific topics, will be published later.

A and height H is compressed to a height h and resulting area AH/h, the work W done in the process is obviously the product of the mean resistance f per unit of area, the mean area acted upon, and the distance of the compression, or

$$W = fAH \log_e H/h \quad [1]$$

If we neglect spread, and assume the material free to extend only in the direction of its length, the length will be increased in the ratio H/h. Thus, if r be the number of elongations, or ratio of final length to original length, we may substitute this term for H/h in the above expression, which then becomes

$$W = fV \log_e r \quad [2]$$

where V is the volume of the block.

If f is in tons per sq. in. and V in cu. in., then W may be stated in horsepower-second by multiplying f by $\frac{2240}{550 \times 12}$ or 0.339, and the expression thus becomes

$$W = 0.339\ fV \log_e r \quad [3]$$

Again, if the draft $(H - h)$ is small, we may substitute for [2] the approximate expression

$$W = fA(H - h) \quad [4]$$

The term $A(H - h)$ is often called the volume displaced.

Either equation [3] or [4] may be used for estimating the net energy required for a given pass, selecting a value of f appropriate to the temperature. In addition to this, energy will be required to overcome the friction at the roll necks, etc. Any surplus torque over and above these requirements will be available for acceleration, which of course will vary inversely as the moment of inertia of the system.

Roll-Neck Friction Important

The most important load loss in all mills is due to roll-neck friction. The wedging or separating force exerted by the material between the rolls is a function of the rate at which the material is displaced, and of its physical characteristics, and therefore of the tractive effort required to draw it into the rolls.

If P be the tractive effort exerted on the material and B the width of the piece, then, using the notation previously employed,

$$P = fB(H - h) \quad [5]$$

As the precise pressure distribution over the arc of contact is not known with certainty (some of Kick's experiments indicating, for example, that a certain amount of deformation occurs before the material comes in contact with the rolls), we may, in computing the separating force Q, simplify the expression for the horizontal projection of the arc of contact

$$x = \sqrt{\frac{H-h}{2}\left(D - \frac{H-h}{2}\right)}$$

where D is the effective diameter of the rolls, by neglecting the second term $\frac{H-h}{2}$, which is small relatively to D. The expression for x may then be written

$$x = \sqrt{\frac{D}{2}(H - h)} \quad [6]$$

Hence

$$Q = fB\sqrt{\frac{D}{2}(H - h)} \quad [7]$$

This last equation enables us to compute the stresses in the rolls, housings, etc.

Metallurgical Significance of the Cogging Operation

IT is entirely due to the difference of state between steel in the ingot form and in the worked form that the cogging process exerts its particular metallurgical influence. When an ingot which has not been allowed to cool down, but has been charged into the pits a reasonable time after casting, is drawn from the pit and sent to the mill, it will be virtually frozen right to the center. There will exist in the great majority of ingots, however, a temperature gradient of variable steepness, which plays a most important part in determining its subsequent behavior.

Again, this ingot, although frozen under conditions which in the main favor the reduction in volume of the pipe, will contain voids of greater or less importance, according to the measure to which the deoxidation of the steel has been carried. And the steel in the region of the interior voids or spongy areas will contain the major segregation, and will also, in general, be the seat of the bulk of the non-metallic inclusions.

Closing Voids and Welding Their Sides

During the first few passes the principal effort of rolling will be to close up the existing voids and knit together the inner regions of the ingot. Welding follows whenever the condition of the crystal facets, thus pressed together, allows. The bulk of the total deformation-energy requirements for these passes is expended in this manner, comparatively little going toward displacing the particles in the direction of rolling. When once the ingot has been compressed in this way, practically the whole of the deformation energy subsequently expended will be utilized in displacing the particles in the direction of rolling. There is no sharp line of demarcation between these two phases of the cogging operation, as one merges gradually into the other.

When a steep temperature gradient exists in an ingot it is obvious that the plasticity will increase toward the center. Hence, with a given draft, the friction prisms which the author believes to form under the areas of contact will not be bounded by planes but by curved surfaces, owing to the progressive diminution of the internal friction of the material. Thus they will be flatter, and their disruptive effect on the material lying between their apices (when the apices do not meet) will be less.

Cavities and spongy areas, already referred to, alter the direction of the normal plastic flow, arising from the pressure head at the surfaces of the prisms, by providing easier paths for the displacement of the highly stressed material. This results in the general transverse compression which, as has been said, is the characteristic feature of the early passes in cogging. This compression will be accompanied by a slight rela-

Table I—Rolling Temperatures at Blooming Mills

Authority	Ingot: Mean Cross-Section, In × In.	Ingot: Weight, Tons	Nature of Work Done: Section Rolled to, In. × In.	Nature of Work Done: No. of Passes	Total Time at Mill, Secs.	Temperatures: After Third Pass, Deg. Cent.	Temperatures: After Last Pass, Deg. Cent.	Class of Steel C, Per Cent	Mean Draft,(b) Per Cent
Puppe	18.7 × 18.7	2.5	6.2 × 5.6	23	207	1169	1119	0.25	9.55
Puppe	18.7 × 18.7	2.5	6.2 × 5.6	23	255	1133	1069	0.25	9.55
Puppe	18.7 × 18.7	2.25	4.0 × 3.8	29	368	1183	1091	0.13	10.25
Nibecker	18.5 × 20.5	1.9	4.8 × 7.1	15	...	1305	1230	0.13	14.82
Puppe	17.4 × 17.4	2.4	5.75 × 7.5	17	183	1186	1179	0.25	10.83
Puppe	17.4 × 17.4	2.4	5.75 × 7.5	17	174	1200	1198	0.36	10.83
Puppe	17.4 × 17.4	2.5	6.3 × 5.3	19	228	1151	1151	0.06	11.76
Puppe	17.0 × 16.0	1.8	5.2 × 7.0	14	168	1145	1084	0.46	13.39
Puppe	15.0 × 15.0	1.3	5.6 × 7.5	12	143	1176	1091	0.35	13.05
Puppe	15.0 × 12.6	1.1	5.3 × 7.3	8	98	1197	1139	0.10	18.0
Burgess	.....	3.0(a)	.....	..	...	1182	1164	0.45(a)	...
Burgess	.....	3.0(a)	.....	..	...	1064	1064	0.45(a)	...

(a) Approximate figure. (b) Not in original paper.

tive and variable displacement of certain portions in relation to the material by which they were surrounded.

When the temperature gradient at the commencement of rolling is still steeper and the ingot is yet actually liquid in the interior, the frictional prisms, whatever the draft, cannot persist into the liquid. In this case the pressure from the rolls will be transmitted directly to the liquid steel. The liquid, obeying the ordinary fluid laws, will exert this pressure equally in all directions within its volume, and hence will tend to flow away from under the rolls and outward to regions of less stress. It thus permeates the interstices in the still relatively loosely coherent crystals forming the inner layers of the solid envelope, and will there be trapped in the zones of increasing density to which it penetrates and owing to the fall of its own temperature below the solidus point for its particular composition arising from the conduction of heat to the cooler material by which it is now surrounded.

Thus, when a "green" ingot is cogged down, as has been convincingly demonstrated by Mr. Talbot and by Herr Neu, one notices that the segregated material is no longer to be found in its accustomed place in the center of a transverse section, but has migrated further out. It is in a ring whose mean radius is some fraction of the distance from its center to the faces.

Grain Refinement Often Neutralized

The later passes, when the steel is physically homogeneous and of more nearly uniform plasticity throughout, the temperature gradient having become flatter, are of less metallurgical importance. The grain refinement, which is the principal result of the continued deformation, is frequently obliterated when the cogged bloom is reheated, or neutralized by the crystal growth which sets in after the piece has received its final passes, when the temperature will generally be still above the change point.

However, according as the drafts are heavy or light, so will there be a comparatively thorough distortion of the dendrites throughout the mass of the piece, or only a complete distortion of those in the outer zones, leaving those particles in the inner regions practically untouched.

In regard to the general effect of speed or velocity of deformation, apart from the question of intensity of deformation or draft, it would appear that with high rolling speeds the particles (having less time in which to accommodate themselves to the displacements impressed upon them) offer greater resistance to being displaced. The hypothetical immobile transmitting prisms will therefore extend further into the piece (owing to the greater internal friction of the material), and consequently exert a more uniform pressure on the surrounding material, a result analogous to that produced by a heavy draft. But, as already pointed out, the author at present inclines to the belief that the increase of resistance with rate of deformation is a relatively unimportant quantity, at all speeds employed in rolling pieces of relatively large section.

FLEXIBLE TARIFF UPHELD

Court Renders Decision After Pig Iron Increase Was Approved by President

WASHINGTON, March 1.—In upholding the constitutionality of the flexible provisions of the Fordney-McCumber tariff act a decision of the United States Court of Customs Appeals handed down here on Thursday of last week is particularly interesting to the iron and steel trade, because it came at a time when President Coolidge had just approved a report of the United States Tariff Commission which recommended an increase of 50 per cent in the duty on pig iron under these provisions.

The decision of the Court of Customs, which affirmed the finding of the lower court, was unanimous, and was delivered by Judge William J. Graham, who presided. In substance the court held that Congress has authority to delegate to the President power to raise or lower import duties as provided in section 315 of the tariff act. The court said that from a consideration of numerous authorities, which the opinion cited, together with the evident purpose of the Congress as expressed in the act, section 315, "imposing sufficient duties on imported products to equalize the difference in cost of production in the United States and the principal competing country is a valid exercise of the constitutional grant of power to the Congress to regulate commerce."

The question of the constitutionality of the section was raised by J. W. Hampton, Jr., & Co., New York importers, who protested against a Presidential proclamation under the flexible provisions increasing by 50 per cent the duty on barium dioxide. It is understood that the importers will appeal the case to the Supreme Court of the United States.

The importers held that the section was unconstitutional, assigning a number of reasons. It was contended that the section attempted to delegate to the President the power to legislate and the power to tax, powers which can be exercised only by Congress. Also, the importers maintained that the section is a provision, not for a tax, duty or excise, but solely for the protection of industries of the United States, and that the Congress may not, under the powers given it by the Constitution, so legislate. All of these contentions were held by the court to be without merit. The opinion asserted that the single question present for determination was whether Congress, in attempting to grant to the President the power to increase the rates of duty by adding the differences in the cost of production ascertained by him under section 315, acted within constitutional limits, or whether such act was in that respect null and void. The court said it found no error in the judgment of the court below, and, therefore, affirmed its opinion.

Protective Legislation Upheld

The decision of the Court of Customs Appeals pointed out that it was for Congress to select the means by which it thought the best interests of the country would be served in encouraging, fostering and protecting the commerce of industries of the country.

"If it be said that legislation which thus protects one industry at the expense of others should be declared invalid therefor, then we must deny to the Congress the power to lay any duties at all," the court declared. "The power to lay duties implies the power to select the objects upon which such duties are laid. Necessarily, the laying of a duty upon one product and not upon another may give added advantage or disadvantage to the domestic producer of the product thus made dutiable. But what might be said of the inequality of the laying of duties may also be said of all taxes laid for public purposes. The needs occasioned by drought, famine, pestilence and flood, the pauper, the dependent and the criminal are burdens unequally borne; and yet, while the means of one citizen are taken from him to minister to another, it is still deemed to be a public purpose, the benefits of which all citizens equally enjoy. The right of our National Legislature to take such steps as the people, acting through it, may think best suited to protect, foster and encourage its commerce and industrial life cannot be denied: for so to deny it would be to deny the sovereign right which every properly constituted government has to perpetuate itself and to accomplish one of the chief purposes for which it was created."

Bituminous production continues at a high rate, according to figures of the National Coal Association, Washington. The output in the week ended Feb. 19 is given as 13,375,000 net tons. This compares with 13,463,000 tons in the preceding week and 13,583,000 in the week before that. It is reported that many industries are stocking up, in anticipation of a strike.

Wood Grain Reproduced on Steel

Photographed on Copper Plate, Hard Wood Grain Is Transferred to Metal Furniture by Composition Rolls

IN the early period of steel furniture manufacture flat colors of neutral shades were used extensively in finishing the product. Then came the hand-graining process. Skilled painters were trained to imitate on steel the grain of the fine hardwoods, and some beautiful work was turned out. The hand-graining method, however, was slow, costly and dependent on skilled workmen, who were not always available in the requisite numbers.

For many years the need for a better method of reproducing wood grain finishes was apparent, and there was invented, a few years ago, a new means of securing this result in a mechanical manner. Actual photography of real wood formed the basis around which this graining process was produced; consequently the results secured were faithful reproductions.

The equipment used in this process consists of a flat graining plate made of copper upon which the photographic reproduction of wood grain, marble, etc., is permanently etched. Graining compound of the consistency of printers' ink is placed upon the plate, and composition rolls especially designed take the grain impression from the plate. The grain is reproduced on the object to be finished by passing the rolls over the surface. The cost of applying this finish is said to be considerably less than that of former methods employed. The most ordinary labor can be used, and at the same time the finishing department can maintain a standard finish, which heretofore has not been possible.

The Wood Grain Reproduction Co., Long Island City, N. Y., a subsidiary of the Vance Mfg. Co., Dayton, Ohio, has a plant for the commercial reproduction of wood grain finishes on steel, wood or marble products. The grain finish is reproduced from master copper plates with the photographic impressions of different hardwood finishes. The making of these plates calls for the use of a camera that can produce a plate 30 in. wide and 87 in. in length.

The furniture or other object to be finished is first painted the color of wood or marble desired and dried. The grain is then transferred, also in the color desired, and dried again, after which the work is placed in a ventilated booth where a varnish or lacquer is sprayed on by compressed air. The work is then put into a furnace and baked for several hours at temperatures ranging from 180 to 225 deg. Fahr. The furnace is gas-fired and utilizes the indirect heat method, thus obtaining uniformity and evenness in the final finish.

In the vitreous enamel field, which includes the manufacture of soda fountains, signs and tiles for interior and exterior finish, wood grain and marble is also reproduced. In this class of work ground glass is mixed with vehicle oils of various colors, and a coat of this is laid on the work in the place of paint. Colored ground glass is then mixed with the ink on the master plates for the desired graining and transferred to the work. The work is then placed in high temperature ovens, where these coats are fused at heats varying from 2200 to 2400 deg. Fahr. over a period of several hours. In this manner slate and other products are marbleized and given a hard, tile-like, lustrous finish of great durability.

Eighty per cent of the steel office furniture made today is grained by this process, it is said, and 60 per cent of the automobile instrument boards and automobile trim is thus finished. More than 1,600,000 radio panel fronts were treated last year.

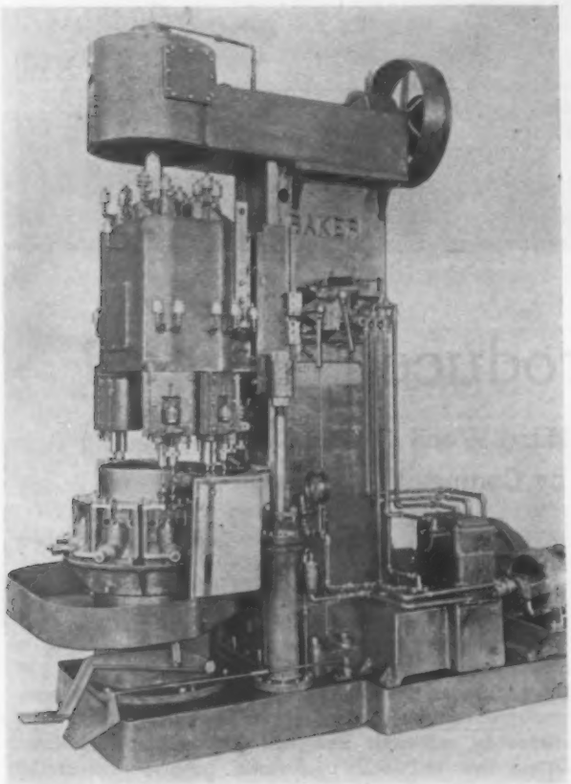
The metal industry of the Soviet Union established new high figures of production during the first quarter of the current Soviet fiscal year (Oct. 1 to Dec. 31), according to statistics received by the Soviet Union Information Bureau. December was the banner month for the past ten years, with a production of 248,225 metric tons of pig iron. The output of iron and steel for the month was 80 per cent of the monthly average of 1913.

BORING AND DRILLING MACHINE

Vertical Machine for Production Work Is Equipped with Hydraulic Feed

A vertical type machine equipped with hydraulic feed and intended for a wide range of single- and multiple-spindle boring and drilling operations has been added to the line of Baker Brothers, Inc., Toledo, Ohio. The machine is designated as the No. 50-H Twin-Pull and is available in a number of sizes and capacities. The hydraulic feed is by means of an Oilgear pump.

The simplicity of design permits the machine to be modified as to clearances, number of spindles in the head, center distance between spindles, etc. The machine is particularly adapted for use in connection with an in-



The Hydraulic Feed Is by Means of a Pull Rather Than by a Push. The machine is equipped for drilling crankshaft counterbalances

dexing table or fixture, either for successive operations on the same piece or for a long drilling operation where it is desirable to break up the operation on account of the excessive wear of the drill and the inability to properly cool the drill or withdraw the chips. In an operation of this kind, the work can be indexed to the first station and fed a portion of the way through and then indexed to the next and fed a portion further and so on, until last operation finishes the entire length of feed. In this way a much coarser feed can be used, and in addition to the increased production, the wear on the drills is markedly reduced.

The head carrying the drills is mounted on a saddle that moves upon scraped ways. Two cylinders are used for the feed mechanism, one on each side of the machine working in unison to give a powerful and extremely smooth drive. The feed is by means of a pull rather than by a push. It is started with a foot pedal and is entirely automatic. The head advances rapidly to the work, automatically feeds at the proper rate during the drilling operation, then reverses automatically, returning rapidly and stopping at the top of the stroke.

The rate of feed and the position at which the rapid traverse starts and stops can be changed quickly by simple adjustments. On the multiple-spindle type machines, all spindles have vertical adjustment to take care of the different drill or tool lengths so that all tools enter the work at the same time. The gears in the multiple head are of alloy steel hardened, and the shafts are mounted on ball bearings. Provision has been made for adequate lubrication of all moving parts.

The machine can be furnished either belt or motor drive. For the latter, two motors are required, one for driving the machine and the other for driving the Oilgear pump. For the pump a 3-hp. motor is required. The motor for the main drive of the machine ranges from 10 to 40 hp., depending upon the size of the work to be performed. The weight of the machine without fixtures, table or tools but with five-spindle head is approximately 4 tons.

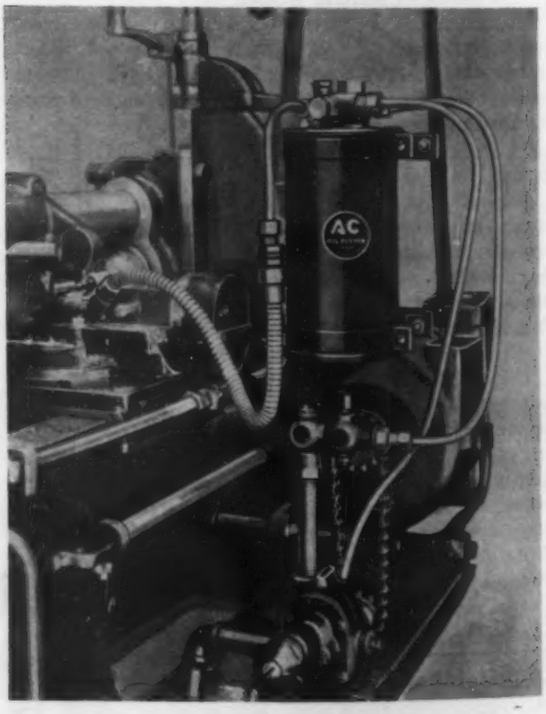
The accompanying illustration shows the machine set-up for drilling forged crankshaft counterbalances. A nine-station table with three indexes is used, and the head is furnished with six two-spindle multiple heads. There are two holes, approximately ½ in. in diameter and 2½ in. deep, in each piece. The operations are as follows: The three fixtures are loaded and the table indexed 180 deg. The first three multiple heads drill half-way through the piece, the piece then being indexed to the last three spindles which complete the drilling. It is pointed out that in this way a coarser feed can be used, because the drills are not required to be fed entirely through the hole.

Oil Filter for Use on Machine Tools

The A C Spark Plug Co., Flint, Mich., has brought out an industrial oil filter for use on machine tools in filtering lubricating oil and cutting compounds.

The device is designed so that when it becomes filled with dirt removed from the oil a replacement cartridge can be quickly installed. Filtering capacity is provided to suit conditions by using banks of several filters connected in multiple. Small machine tools require but one filter.

Investigations made by the company have shown that grit and chips sticking to chuck jaws on machine tools cause wide variation in accuracy and finish, re-



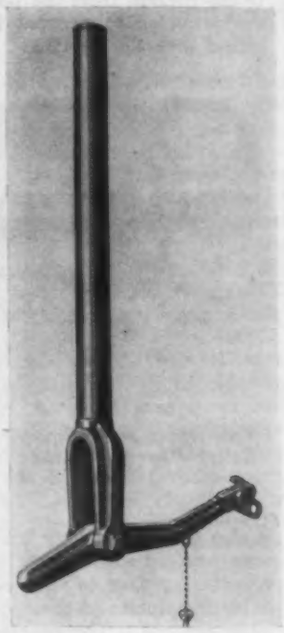
The Filters Are Supplementary to the Sediment Tanks and Strainers

sulting also in eccentricity and chatter finish. In eliminating grit and dirt from cutting compounds and coolants the filters are said to permit of a higher grade of work and to lengthen the life of grinding wheels, cutters and other tools. Other tests have shown that machine tool bearings have a longer life when the lubricating oil is filtered.

Safety Prop for Use in Dropping Cupola Doors

A safety prop for foundry cupolas intended to take the place of the steel bar prop that is commonly used, is now made by the Berkshire Mfg. Co., 1011 Power Avenue, Cleveland.

The device is of simple design. The upper part is of 2½-in. diameter tubing in the top of which is fitted a cast steel plug. The lower part is made up of a cast steel fork to which is bolted a lever that is located slightly off center. At the upper end of the lever is a latch and locking pin of machinery steel. A chain or rope is attached to an eyelet in the lever.



The illustration shows the prop unlocked and collapsed. When propping the cupola door, the lever mounted in the fork is locked in the upright position. When the doors in the bottom of a cupola are to be dropped, a workman withdraws the locking pin and pulls the chain or rope which causes the prop to collapse and with the removal of the support, the doors drop and the falling slag and metal carry the prop under the cupola. When removing the prop and dumping the cupola the workman stands at a safe distance. When the prop is being put in place it acts as a lever in pushing the doors up tightly against the cupola.

Improved Grinding Equipment Offered

Redesigned grinding equipment added recently to the line of the Standard Electrical Tool Co., Cincinnati, includes an angle plate parallel grinder; a motor-driven floor grinder; and a grinder, polisher or buffer for suspension from a traveler or counterbalanced on a pulley. The angle plate parallel grinder, shown in the left-hand illustration, is adapted for roll grinding and general grinding on a lathe or surface grinding on a planer or boring mill. The angle plate is bolted to the compound rest of the lathe and bolted to the ram of a planer or a boring mill.

This grinder is manufactured in ¼-, ½-, 1-, 2- and 3-hp. capacities. The motor can be furnished either for direct or alternating current. The armature shaft is of 3½ per cent nickel steel and is ground to size. The bearings are of phosphor bronze, of split taper type, adjustable for wear and are in dust-proof housings.

The new motor-driven floor grinding machine, shown in the right-hand illustration, is available in two sizes, of 3-hp. and 5-hp. capacity respectively. The motor and push button control employed is of General Electric Co. design. The control equipment is located on the inside of the base of the machine. The armature shaft is of 3½ per cent nickel steel and the S.K.F. ball bearings used are incased in dustproof chambers. The emery wheel guards are of the hinge-door type with exhaust connections, and are equipped with a spark breaker, also an adjustable wired glass eye shield. The smaller machine may be equipped with 12 in. x 2 in. or 14 in. x 2 in. emery wheels, while the 5-hp. grinder carries 18 in. x 3 in. emery wheels.

Five sizes of the grinder arranged for suspension from a traveler are available, these sizes being ¼, ½, 1, 2 and 3 hp. This type of grinder is especially adapted to surfacing rough castings, and cleaning castings of all descriptions. The tools can also be equipped with canvas wheels for polishing or hand buffing. They can be suspended from traveler or counterbalanced on pulley.

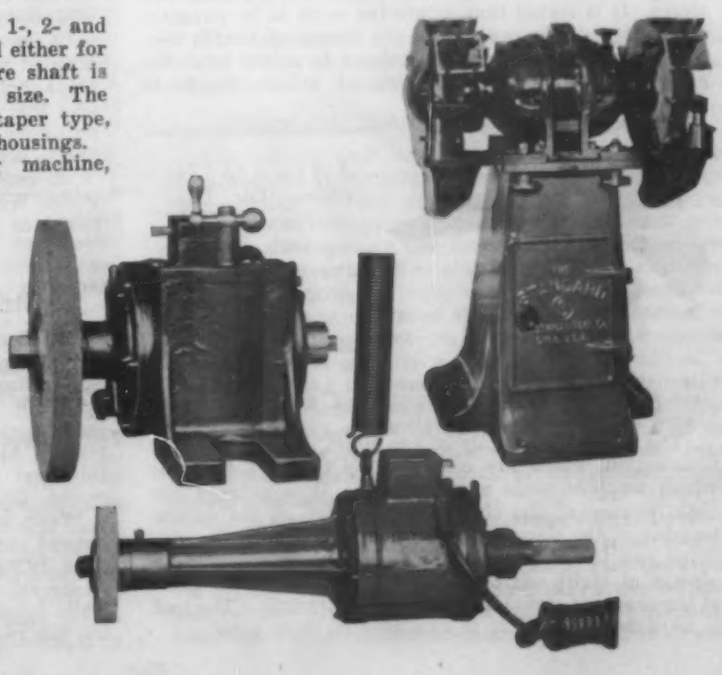
The machine has three ball bearings on the armature shaft, the bearings being incased in dustproof chambers. The armature shaft is of 3½ per cent nickel steel. The motors are especially designed for continuous duty electric tool service.

Transformers for 25-Ton Electric Furnaces of Timken Plant

The largest capacity transformers ever built for use with steel melting furnaces will be used by the Timken Roller Bearing Co. in connection with the installation, soon to be made, of two 25-ton melting furnaces of the Heroult type at Canton, Ohio. The transformers, now being built in the Erie shops of the General Electric Co., will have a continuous rating of 7500 kv-a., a short-time rating of 9000 kv-a., will operate on a 22,000-volt, 3-phase, 60-cycle circuit, and will be of the water-cooled type. Three are being built, two to be used to supply current for the two new furnaces, and the other to be reserved as a spare until an additional furnace is installed.

Gear Makers to Meet in Jackson, Mich.

The eleventh annual meeting of the American Gear Manufacturers' Association will be held at the Hayes Hotel, Jackson, Mich., May 12, 13 and 14. The meeting will mark the tenth anniversary of the formation of the association.



The Armature Shafts of the Motors Are of Nickel Steel and Are Mounted in Ball Bearings. The angle plate grinder is available in five sizes and the floor grinder in two sizes. The machine shown in lower illustration is for surfacing and cleaning castings

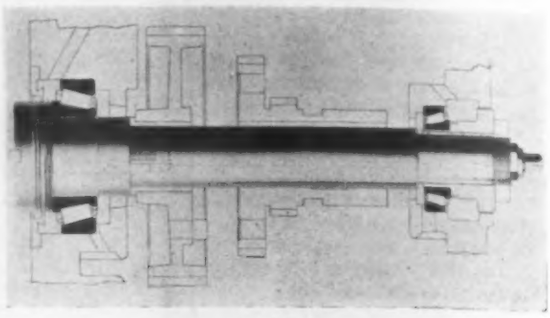
Tapered Roller Bearings Applied to Main Spindles of Milwaukee Millers

The mounting of the main spindles on Timken tapered roller bearings will be a regular feature of the ten larger size Milwaukee milling machines, according to an announcement by the Kearney & Trecker Corporation, Milwaukee. This application is in addition to the roller bearings employed in the gear train leading up to the spindle, and is said to be the result of more than six years of research.

Plain bearings for milling machine spindles have been favored, states the company, because of the belief that a spindle mounted on plain bearings is more rigid and will cause less cutter chatter. Extended tests made by the company are claimed to have proved that the opposite is true. "A spindle mounted on tapered roller bearings is more rigid because the thickness of oil film required between the rolls and races is much less than the thickness of oil film required for the successful operation of a plain bearing," states the company. "A roller bearing has practically metal to metal contact, whereas the plain bearing must have oil space. The thickness of film in a plain bearing construction varies on opposite sides of the spindle, and the spindle in reality floats in a ring of oil which allows it to run slightly eccentric—the amount of eccentricity varying with the load, speed, viscosity of the oil, and the amount of oil space or clearance."

The tests of the roller-bearing mounted spindle included a speed test in which a variable-speed motor was connected directly to the shaft below the spindle so that the drive was through gears, as in normal operation. It is said that it was possible to run the spindle as high as 2600 r.p.m., continuously for 8 hr. For testing the thrust capacity, a 1 9/64-in. high-speed drill was mounted in the spindle and, using the cross-feed table travel, the tool was fed into S.A.E. 1020 steel at the rate of 9 in. per min. Milling tests, using a 10-in. diameter face milling cutter across a heavy cast-iron block, are said to have shown finer finish of the work, the cuts being cleaner and the amount of stock removed considerably less.

The accompanying illustration shows the arrangement of the bearings. The large roller bearing at the front of the spindle has its cone or inner race pressed solidly on the spindle and the cup or outer race pressed directly into the column front. Lubricating oil constantly flows in at the rear of the bearing, is passed through by the action of the bearing, and is returned to the column from the pocket at the front. Oil slingers are provided to prevent the entrance of cutting compound into the bearing. The cup of the rear bearing



The Spindle Is Equipped With a Large Tapered Roller Bearing at the Front and a Smaller One at the Rear

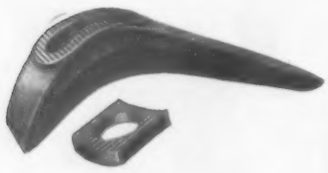
is also pressed directly into the column casting and the cone pressed into a long sleeve which is keyed to the spindle, but free to slide endwise for adjustment. The adjusting nut is at the rear of the spindle in an accessible position. The bearings are given an initial tension or load when being adjusted at the factory, to assure operation of the spindle for a long period of time without further adjustment. The bearings used are of what is known as "spindle quality," the maximum allowable eccentricity of which is 0.00025 in.

The adjustment of the spindle is said to be practically self-compensating for changes of temperature. The adjustment is made at room temperature.

Adjustable Strap Clamp for Use on Machine Tools

The Billings & Spencer Co., Hartford, Conn., is marketing a new adjustable strap clamp, for holding work on planers, boring mills, drill presses, face plates of lathes and milling machines.

The design permits use of the tool on work of irregular shape and of various sizes without blocks and shims. It is stated that where the work to be strapped is larger than the capacity of the clamp, all that is necessary is to use a block not greater in height than the piece to be strapped. Blocking of definite height is



Adjustable Clamp For Use on Planers, Boring Mills, Drill Presses and Other Machine Tools

thus unnecessary. No shimming of any kind is required with this design of clamp.

The clamp is made up of two parts, as shown in the illustration, which are connected by the tie-bolts with which machine tools are equipped. It is pointed out that because of the changeable position of the saddle member of the clamp, tension between T-slot of the machine and the saddle, transmitted through tie bolts, is always at right angles and perpendicular to the table of the machine, providing maximum strength. The tool is hardened in oil. It is available in three sizes.

Cost Problems Discussed by Southern Metalworking Manufacturers

The North and South Carolina divisions of the Southern Metal Trades Association held a joint meeting at Salisbury, N. C., Feb. 18, at which costs of doing business were discussed. A paper on proper methods of cost accounting was presented.

The Wayne Agricultural Works, Goldsboro, N. C., was proposed for membership.

A novel method of bringing in new members was adopted whereby six months' complimentary memberships shall be presented to desirable companies with the idea that such affiliation will give non-members an opportunity to observe the workings of the association and to determine whether it will be of benefit to them.

A resolution of condolence on the death of W. S. Pfohl, Winston-Salem, N. C., a member of the association, was adopted.

Strength of Ore and Top Rock

Studies of the native ore and rock forming the pillars and roof in a mine have been made by the United States Bureau of Mines. Technical paper 379, written by W. R. Crane of the bureau, records such studies made in the red iron ore mines of the Birmingham district in Alabama. Copies of the pamphlet may be obtained at 10c. each from the Superintendent of Documents, Government Printing Office, Washington.

Tests on the compressive strength of iron ore cubes showed variations between 8350 lb. per sq. in. and more than 18,000 lb., or twice as much. Tests were made under conditions of vibration, as well as static tests, while bending strength tests were made of samples of the top rock.

Structural Welding and Riveting

Data on Both Processes Presented at Philadelphia Meeting —More Extensive Use of Welded Steel In Manufacturing Suggested

WELDING and riveting as applied to structural steel was the topic discussed at a well-attended meeting, held Feb. 21 at and under the auspices of the Engineers Club of Philadelphia, with the cooperation of the Philadelphia section of the American Welding Society. Five papers were presented, three of which were devoted to welding and two to riveting, and M. F. Farmer, chief engineer of the Electrical Testing Laboratories, New York, and president of the American Welding Society, made a brief prefatory address. R. D. Thomas, president of R. D. Thomas & Co., Philadelphia, presided.

Strength data on girders and structural steel joints developed expressly for arc-welded connections were presented by A. M. Candy, welding engineer of the Westinghouse Electric & Mfg. Co., East Pittsburgh. Mr. Candy's address was on the subject of "The Rational Design of Structural Steel Joints for Arc-Welded Connections," and was illustrated by numerous slides. The data presented were from the series of tests conducted by the Westinghouse company at the Carnegie Institute of Technology, July 28 and 29, 1926, as reported in THE IRON AGE of Aug. 5, 1926, and presented last fall before the annual conventions of the American Institute of Steel Construction and the American Welding Society.

Continuity Obtained by Welding

Column connections designed expressly for arc welding were described to show that continuity may be obtained with arc welding at less expense and that the welded connections are stronger than conventional riveted connections. Data relating to welded tension members were given, and the design and results of tests on a series of three simple beam specimens, in one of which the column connection followed standard riveting practice, were outlined. Of particular interest was the data on the design and tests of a series of four plate-girders. One of these girders was riveted and another, constructed of the same parts, was welded. The third girder was designed to take full advantage of the possibilities of joining structural steel members by arc welding to produce a girder of equal strength using less weight of steel. The fourth specimen was also designed to take maximum advantage of arc welding and was of the same weight as the riveted girder. It was intended to show that the metal saved by the welded connection can be used to increase the strength of the member. Vibration and shock tests on riveted and structural members, carried out at East Pittsburgh, were also outlined.

Among the conclusions from Mr. Candy's address was that welded joints can be constructed that will develop the full strength of the structural member and that beams and girders can be connected to columns so as to produce absolute fixation. Another conclusion was that lines of beams or girders can be connected so as to provide complete continuity across the supports.

Frame of Sharon Building Welded

Views were shown of the arc-welded steel frame for the five-story manufacturing building of the Westinghouse company at Sharon, Pa., at various stages of erection, including close-ups of beam and column connections, and welding operators at work. This structure is 70 x 220 ft. in plan and 80 ft. high. Design of the welded connections was based for the most part upon the findings of the tests at the Carnegie Institute of Technology. The field erection work was started on Oct. 29, 1926, and on Dec. 3 all the steel had been erected. Welding was completely finished on Dec. 22. Saving in steel, so far, by means of the welded design was said to be of the order of 10 per cent, but it is expected that greater economies will be attained as better designs are evolved. It was also pointed out that in being easier to paint, the welded design would help in meeting the problem of corrosion. Another advantage of the welded design will be the facility of making changes in a structure, it was said.

Stresses Dependability of Riveted Assemblage

The dependability and other features of riveted assemblage of structural members were stressed by A. F. Jensen, president of the Hanna Engineering Works, Chicago, who followed Mr. Candy on the program. Mr. Jensen's paper, under the title of "This Is the Age of Riveted Steel," followed in the main his address at the fourth annual convention of the American Institute of Steel Construction, reported in THE IRON AGE of Nov. 4, 1926, page 1327.

"There is a field of usefulness for both welding and riveting," he said. "The dependability of riveting and its contribution to engineering progress are reflected in every direction. . . . Riveting is fundamentally sound, has played an important part in the development of our most important industries and will be supplanted only by methods more economical, less dependent on skilled labor and assuring equal safety. We are not opposing welding for it has a very useful field. In the interest of public safety we object to its improper and indiscriminate use."

"Riveting is one of the oldest arts and there are no intangibles when considering its application," said Mr. Jensen in another part. "Accurate data are available regarding every phase and type of riveting; inaccurate assumptions on the riveting side of the comparison (of welding and riveting) are inexcusable. Welding, however, has not progressed to a point where authentic data are available, leaving this side of the comparison to be based on assumptions only."

Dependence on the human element in welding was stressed, and in this connection he said: "In all the data or structural welding which I have read, it is obvious that the welder knew that the weld was for test purposes. The most skilled and conscientious welders have been employed; supervision has been close and comprehensive and the conditions have been test conditions, all of which will not prevail with mass production."

The question of closer tolerances necessary in the welded design was mentioned, beams having to be machined to exact length and the ends squared.

Alining and Locating Value of Rivet Holes

The alining and locating value of matched rivet holes was one of the advantages stressed in connection with riveting. "They predetermine the squareness of the structure irrespective of the erectors," said Mr. Jensen. "Rivet holes are located in the shop where their accuracy may be established with certainty and economy and with the assurance that the discriminating plans of the designing engineer are conformed to in the field. They establish location, level and squareness surely and quickly."

In discussing the dependability of the riveted joint, it was pointed out that there is not an important bridge in service today which was built 30 years or more ago that is not carrying loads far in excess of those originally contemplated. Failures of tanks and other welded products were cited.

Discussions comparing the possible future developments of welding with riveting practice as it now exists seem to assume, said Mr. Jensen, that the riveting art is at a standstill. "In the riveting art we may look forward to the introduction of portable yoke riveters, much lighter than machines now in use, alloy steel

rivets, the acceptance of cold riveting, power-actuated mechanical devices for the manipulation of riveters on straight-run work whereby the bucker-up is eliminated and the operator controls two or more riveters merely by the manipulation of valves, making it possible for a crew of four men to drive at least 50 rivets per minute, and the introduction of multiple riveting machines which will drive at least a dozen rivets for each operation cycle. A combination of cold riveting and multiple riveters constitutes the most promising possibility for the reduction of structural steel fabricating costs."

Welded Steel for Machine Bases

Although the use of arc-welding for the joining of parts formerly riveted received attention by J. F. Lincoln, vice-president of the Lincoln Electric Co., Cleveland, in his address on "Arc Welding as Applied to Manufacturing," the use of welded steel in place of castings received even greater emphasis.

Welding was employed in constructing an addition to a building formerly occupied by the Lincoln company. This welding was done in 1917, and upon inspection in 1923, when the old building was abandoned, all welds were said to have been found in first-class condition.

Although widely known as a useful tool in repair work, arc welding will be used to even greater advantage in manufacturing—as a substitute for riveting and even more as a means of replacing castings with welded steel parts—said Mr. Lincoln. The physical characteristics of steel as compared with cast iron were outlined to show the greater economy of steel shapes joined by arc welding.

The use of structural steel for bases of machines was discussed and some of the steps in redesigning such machine parts for arc welding were outlined, it being shown that it is less difficult to design a machine base of arc welded steel. The designer in welded steel, works directly for the ultimate result, it being unnecessary to allow for casting shrinkage, draft on patterns, cores, fillets, etc.

Application of welded steel in the manufacture of lathe beds was of interest. Since such a bed is called upon to withstand a bending stress, the steel section best suited for the purpose was said to be the I-beam. Instead of the heavy cast-iron base, two I-beams would be joined solidly together by arc-welded cross braces. The legs would be made either of I-beams, standard channels or angles. Hardened steel ways screwed to the tops of the I-beams would replace the cast iron ways, the steel ways being readily renewable when worn. The welded steel lathe would be stronger, lighter and cheaper, said Mr. Lincoln, although obviously it would not look the same.

Advantages claimed for the substitution of welded steel for cast iron included reduction in cost of development work of new design; elimination of pattern expense; elimination of obsolete parts; reduction in amount and cost of necessary machining and reduction in raw material inventory and total material cost. Elimination of the laying out of rivet holes and use of template and patterns were among the advantages claimed of the welding process as compared to riveting.

Mr. Lincoln stated that his company has largely eliminated the use of castings in its products, and that the inventory of steel is less than 11 per cent of the former casting inventory. This saving in inventory he pointed out would be greater where castings are used on a large scale in the product.

The chief reason for the more extensive use of steel for machine and other parts he said was because "we are just not used to it. We have been used to bulky shapes, heavy sections, rounded corners and tapering members because cast iron has to be bulky to get sufficient strength and has to be tapered and rounded in order to draw the pattern from the sand." The replacing of castings by welded steel was stressed by Mr. Lincoln as having large future possibilities.

Improvements Being Made in Riveting Equipment

Another paper presenting data on riveting as applied to structural steel was that of J. C. Hanna, chief engineer of the Hanna Engineering Works, Chicago, whose address was entitled "The Rivet."

"One of the first steps in the comprehensive procedure leading to the change for improvement of a structure or method of construction is a thorough analysis of the existing method in order that all its virtues may be comprehended and weighed," said Mr. Hanna. "If this is not done, important or even essential good qualities may be lost in the change."

"We are faced with the problem of determining which joints are best made by riveting and which best by welding," he continued. "In an attempt to draw a line between the practical fields of application of these two joining methods we can and should follow the correct procedure as established by experience. Therefore, one of the first steps should be to familiarize ourselves thoroughly with the rivet and the riveted joint."

The manufacture of rivets was outlined briefly, showing that the repeated hot rolling sets the grain longitudinally so that the steel best resists the shear and tension to which it is subjected in service. The development of various methods of driving rivets was reviewed, from the hand-hammer to present day equipment, which includes portable pneumatic riveters, weighing 30 tons and capable of driving 1⅝-in. rivets of boiler quality through 5-in. grip, and a portable machine for driving 2¼-in. rivets cold. It was stated that further improvements and refinements of riveting-methods, as well as marked reduction in riveting costs, are to be expected in the near future.

Single machines are being built, said Mr. Hanna, into which plain standard structural shapes, such as plates and angles, can be placed and which will produce a column prepared for riveting. The saving from the use of this machine will be approximately $10 per ton. A multiple-riveting unit is to be added to this machine for the complete fabrication of the columns, ready for milling, splice plates, brackets and field erection. With this arrangement three men will do the riveting formerly done by 12, further reducing the cost. The machine is said to be adapted also for the fabrication of girders and H-section columns. Further economies in structural shops were said to be effected by cold riveting.

Weld Metal Falls Short in Ductility

In discussing the strength of welded joints, weld metal was said to fall short of the strength specifications for steel chiefly in ductility. Data were presented on the failure of steel in fatigue and on the endurance limit of weld materials. The often cited similarity of weld steel to an ingot before soaking or a steel casting before annealing was also discussed.

Regarding the continuous construction of beams, made possible by weld joining, Mr. Hanna said, in the concluding section of his paper: "Such construction is possible with riveted joints, even at columns. This has been long recognized and many printed discussions are available on the subject. Also bear in mind that the whole theory of continuity is dependent upon the assumption that columns will forever have exactly the same relative height they had when beams and girders were joined. If one column should settle slightly the positive and negative moments would change materially. The continuous beam value would be reduced if not entirely lost, even though the joints remain unbroken.

W. L. Warner, General Electric Co., Schenectady, also spoke at the meeting. His subject was "Welding of Structural Steel."

Second Conference on Electrical Industrial Heating

The second annual conference on industrial electric heating will be held at Purdue University, Lafayette, Ind., March 23-25. The conference is under the direction of the school of electrical engineering and in cooperation with the electric utilities and the manufacturers of electric heating equipment.

Developments in electric industrial heating, its application to low, medium and high temperature work, will be discussed, and demonstrations of equipment will be a feature. This meeting is arranged for the benefit of the industries of the State.

HISTORY OF BEAM DEPTHS

From 15 In. 40 Years Ago, Expansion Has Been Gradual to a Maximum of 30 In. Since 1908

IN connection with an announcement of a new series of beam and column sections, as described briefly on page 505 of the Feb. 17 issue of THE IRON AGE, the Carnegie Steel Co. reviewed American beam practice of the past 40 years. The following paragraphs are taken from that review:

Forty years ago the largest metal beam section rolled was 15 in. deep. This size supplemented the previous 12-in. maximum, not because it was part of a consistent series, but because new mills had been built which could produce it. In 1889 a still larger mill was built, capable of producing beams 20 in. deep. This size was added to the list, again not because it belonged in an orderly sequence, but because it was the largest size then producible. Soon after 1890 a 24-in. size was added, for similar reasons, and an 18-in. section was interpolated between the 15-in. and 20-in. sizes.

In 1896 standardization was reached with regard to beam sections. American beams, 8 in. and larger, then comprised 8, 9, 10, 12, 15, 18, 20 and 24-in. depths. About 1908 a new type of mill made it possible to produce still deeper beams. Sizes of 26, 28 and 30 in. then were offered, together with an interpolated 22-in. depth. Shortly thereafter, sections 21 and 27 in. deep were produced.

Last year the range below 12 in. was amplified by the exploitation of new joist beam sections with very narrow flanges, and light weights. [This refers to the Jones & Laughlin junior beams, brought out for residential and other light building construction.]

Thus we find the ranges below 12 in. and above 18 in. were fully covered by a profuse variety of depths, with steps of not over 2 in. in each case. It was partly to fill in in similar manner the important range between 12 and 18 in., in which occurs the greatest normal tonnage demand, that the new Carnegie sections were designed. In this range there was previously only the one intermediate beam depth of 15 in., with 3-in. steps both above and below. The Carnegie list now includes 14-in. and 16-in. sections, so that now any desired height below 30 in. may be obtained, with no steps greater than 2 in.

Mexican Metal Tariff Higher

WASHINGTON, Feb. 28.—Included in changes in Mexican import duties on approximately 350 items is an increase from 0.18 to 0.20 peso per legal kilo on articles of iron and steel "not specified," weighing more than 10 kilos, according to cablegrams received by the Department of Commerce from Acting Commercial Attaché George Wythe, Mexico City. On these iron and steel products weighing up to 10 kilos the increase is from 0.30 to 0.40 peso per kilo. On articles of copper or its alloys "not specified," weighing more than 10 kilos, the duty has been increased from 0.30 to 0.50 peso, while an increase has been made from 0.60 to 0.90 peso per kilo on these articles weighing up to 10 kilos.

The new rates become effective March 7 and will carry a surtax of 12 per cent of the duty.

American Rolling Mill Co. Buys Norton and Ashland Plants

Purchase of the entire holdings of the late T. M. Adams in the Norton Iron Works Co. and the Ashland Steel Co., Ashland, Ky., has been consummated by the American Rolling Mill Co., according to an announcement made by J. C. Miller, general manager Ashland, Ky., works American Rolling Mill Co. Negotiations had been in progress for several weeks and were concluded sooner than had been anticipated by the interested parties. Plans regarding the operation of the two companies have not been made public beyond the fact that the blast furnace of the Norton company will be blown in when necessary repairs have been completed.

At the reorganization meeting of the Norton Iron Works Co. the following officers were chosen: J. H. Frantz, president; J. C. Miller, vice-president; R. C. Phillips, secretary; C. W. Verity, treasurer; G. W. McNeilly, assistant secretary and assistant treasurer. Directors are: C. W. Verity, J. H. Frantz, C. R. Hook, R. C. Phillips, J. C. Miller, S. R. Rectanus and W. W. Sebald.

The Norton Iron Works Co. owned, in addition to a blast furnace of 350 tons daily capacity, a wire mill, nail mill, wire cloth factory and a foundry. The Ashland Steel Co. owned a blooming mill and a rod mill.

Effect Merger of Ohio Fabricating Companies

The Macomber Steel Co., Canton, Ohio, has been formed with a capital of 50,000 shares of common stock to take over the assets and business of the Massillon Steel Joist Co. and the Canton Bridge Co., both of Canton. The new company will specialize in the manufacture and fabrication of steel building products.

The company will be managed by the same individuals who have been at the head of the Massillon Steel Joist Co. since its purchase of the Canton Bridge Co. in 1925. Stanley Macomber, president of the new company, has been associated with the Massillon Steel Joist Co. since its founding at Massillon in 1923. J. E. Moss, chairman of the board, is president of the J. E. Moss Iron Works, Wheeling, W. Va. C. W. Anderson, vice-president and sales manager, and E. E. Mosser, secretary and treasurer, held corresponding positions in the Massillon company. H. M. Bringhurst, chief engineer, came to the old company from the steel joist division of the Central Steel Co., Massillon, now a part of the Central Alloy Steel Corporation, Massillon. H. Hildenbiddle, production manager, was for 10 years chief engineer in charge of construction for the Wheeling Steel Corporation.

Powder Replaces Liquid Solution In Parker Rust-Proofing Process

A chemical compound in the form of powder for use in its process for rust-proofing iron and steel has been developed by the Parker Rust-Proof Co., Detroit, to take the place of the liquid solution formerly used in this process. Not only is the powder much easier to use, but it is claimed to give very much better results.

Under the old process the rust-proofing solution included liquid acid, a powder and iron filings. The different ingredients were placed in the bath by a workman and there was always a possibility that they would not be added in proper proportions, as a result of which the solution would get out of balance. This human factor has to a large extent been eliminated by the use of the powder, which permits the complete manufacture of the solution in the factory of the Parker company rather than in the tank in which it is used. Another advantage of the powder is its ease in handling. It is shipped in wooden kegs of 100 to 250 lb. capacity, which are much easier to handle than the glass carboys in which the acid formerly used was shipped. There has also been a reduction to 1/6 of the weight of the material as compared with the liquid compound.

The powder is composed of acid salts, its ingredients being acid phosphates of iron and manganese. These take the place of the iron filings that were used with the former process. When these salts are placed in the bath a dissociation takes place and a small amount of free phosphoric acid is released which initiates the rust-proofing. The rust-proofing coating is produced on the metal by forming thereon insoluble phosphates of iron and manganese. The latter because insoluble form a phosphate type of coating on the metal which has greater rust-resisting qualities than the coating produced by the ingredients formerly employed. The acid salts when in the bath keep feeding out iron and manganese into the solution while the work is in process.

An outstanding advantage claimed is that the solu-

tion is kept in balance by means of the hydrolytic dissociation. The dimensions of the article are kept the same after coating as before by the relationship of the two phosphates to the iron content, providing a balanced solution.

A sample of the bath is analyzed by titration to show the amount of the acid present and roughly measures the amount of salt present. After the test is made a table shows the amount of powder that should be added to bring the solution up to the required strength. However, it is stated that an experienced workman can accurately judge the amount that should be added to obtain the right concentration without making the test.

The quality of the work is claimed to be more uniform than that rust-proofed under the old process and a better base is provided for the application of paints, varnishes and other finishes. It is also stated that the rust-proofing does not increase the size or change the contour of the work treated and that in the rust-proofing of bolts no sediment is left on the threads. Pieces thus rust-proofed have been subjected to a salt spray test approximately 100 hr. before showing signs of corrosion.

The first step in the process is cleaning the parts in a soda solution or by sand blasting. The work is then placed in containers and dipped in a processing tank, the temperature of which is maintained at near the boiling point. By the chemical reaction in the bath the surfaces of the work are converted into insoluble phosphates. After being dried the parts are given whatever finishing coating is desired.

Estimates 1927 Steel Output at 90 Per Cent of 1926

President Campbell of Youngstown Sheet & Tube Co., at Meeting of Representatives of Employees, Said Costs Had Been Reduced $5 a Ton and He Touched on Wages

YOUNGSTOWN, March 1.—In a statement to employees of his company, President James A. Campbell of the Youngstown Sheet & Tube Co. stated that indications pointed to a rate of activity this year in the steel industry equal to about 90 per cent of the rate maintained in 1926, which he said will be satisfactory. The company held its ninth annual conference between representatives of employees and of the management, in its employee representation system.

President Campbell said that the company's markets have been localized to some extent by high freight rates, especially in rods, wire, plates, sheets and bars. "These conditions made it imperative for us to keep our costs low and to diversify our products by adding to them seamless tubes and tin plates. We still have before us a two years' program. In the last five years we have been able to reduce costs an average of $5 per ton, but we must keep on doing this, because other competing companies are doing it and the only way we can get business is to meet competitive prices in the markets now available to us."

Mr. Campbell stated that the principal item in costs is labor and that the American steel industry is beginning to feel the effect of competition from abroad. "The Germans are landing finished steel products in this country at lower prices than we can make them," he said. "Some pig iron has come in from India. In Germany and Belgium, workmen are paid only one-third as much as in this country, and in India far lower than that.

"I do not believe there will be any reduction in wages here for some time to come, and I hope that this will never be necessary; but unless wages rise abroad, it may come some time. I hope that there will be an adjustment that will raise wages in competing foreign countries, and that the inevitable adjustment will involve small, if any, reduction in wages here. In the Pittsburgh and Youngstown districts, wages are from 2 to 6 cents per hour better than in some of the Eastern districts, and of course this affects us considerably in the matter of competition with eastern plants."

President Campbell commented on the fact that it is now necessary to meet lower prices than have prevailed for some time.

Metallurgical Books That Are of Value in Plant Library

A circulating library is maintained by the Kimberly-Clark Co., paper manufacturer, Neenah, Wis., to encourage the reading of technical literature by employees. At present the library has more than 400 volumes, including books on metallurgical, chemical and other subjects. In response to an inquiry from THE IRON AGE, A. S. MacArthur, librarian, says that the following six books on metallurgical subjects are most in demand:

"Metallography and Macrography," by Guillet and Portevin.
"Metallography and Heat Treatment of Iron and Steel," by Sauveur.
"The Science of Metals," by Jeffries and Archer.
"Combatting Corrosion in Industry."
"Corrosion of Metals," by Evans.
"Bearings and Bearing Metals."

In addition to the above, the following books are also in frequent use:

"Metallography of Steel and Cast Iron," by Howe.
"Physical Metallography," by Heyn and Grossmann.
"Examination of Iron, Steel and Brass," by Hall and Williams.
"Metallurgical Analysis," by Lord and Demorest.
"Heat Treatment of Steel," by Oberg.
"Chemistry of Engineering Materials," by Leighow.
"Metallurgy of Iron and Steel," by Stoughton.

It would be interesting to hear from other manufacturing plant libraries as to the technical books which have been found of most service to employees.

Composition of Materials Within a Blast Furnace

Samples of coke, metal, slag, limestone and stock recovered from various points between the tuyere plane and the stock line of a blast furnace making foundry iron have been studied by the United States Bureau of Mines. A paper by S. P. Kinney of that bureau, known as technical paper 397, has just been published. Copies may be had from the Superintendent of Documents, Government Printing Office, Washington, at 5c. each.

The investigation was undertaken in connection with measurements of gas composition, temperatures and pressures at a series of planes in the furnace. Aside from giving the position of the zones of reduction, calcination and slag formation, the samples, if complete and representative, would be valuable in determining where the iron acquires its carbon, sulphur, phosporus, manganese and silicon.

Specimens collected from the interior of the furnace came from sample holes opened up. The stock was blown out of the furnace into a metal container. Here the materials were allowed to cool in an air-tight chamber in a reducing atmosphere. The samples, composed of a mixture of various materials, were large enough to be separated into portions for analysis. The paper shows many of these analyses and curves derived from them.

Exports Higher; Imports Lower

January the Second Best Export Month in Three Years —Seven-Month Total 30 Per Cent Above Last Year —Imports Lowest Since November, 1924

WASHINGTON, Feb. 28.—Aggregating only 63,452 gross tons, imports of iron and steel in January were the lowest since November, 1924, when the total was 35,707 tons. An outstanding feature of the January import movement, and one which largely explains the heavy decline, was the small quantity of incoming shipments of pig iron. This amounted to but 9326 tons, the lowest monthly import movement since November, 1923, when the total was 9299 tons. Imports in January were 12,107 tons less than in December, 1926, when they aggregated 75,559 tons. For the seven months ended January, 1927, imports totaled 557,485 tons, against 546,819 tons for the corresponding period of one year ago.

In contrast to decreased incoming shipments in January, exports increased to 215,235 tons, the largest outgoing movement since last November, when the total was 219,830 tons. That was the heaviest month's export shipment since January, 1924, when the total was 247,343 tons. For the seven months ended January, 1927, exports amounted to 1,361,527 tons, against 1,053,288 tons for the corresponding year of one year ago. Exports in January of the current year showed a gain of 17,046 tons over those for December, when the total was 198,189 tons.

Added to the import table, beginning with January, is the item of ferrochrome, the only change made by the Iron and Steel Division, Department of Commerce. Imports of this product for the month amounted to 359 tons, of which 316 tons came from Germany and 43 tons from France. For the seven months ended January, imports of ferrochrome totaled 552 tons while in January, 1926, they amounted to 50 tons.

Belgium led all imports in January, with 19,092 tons. Germany was second, providing 17,347 tons, of which 5272 tons was pig iron, being the largest tonnage of this product from any one country. The greatest item of imports in January related to structural shapes, with a total of 11,363 tons, of which 9683 tons came from Belgium and 1218 tons from Germany. The sec-

Imports of Iron and Steel in Gross Tons

	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
Calendar year 1924...	556,814	209,109	59,910	255,157
January, 1925	77,105	41,344	7,165	15,498
February	92,353	47,803	10,997	9,666
March	92,115	50,803	5,691	24,330
April	71,233	33,299	7,699	14,941
May	67,789	21,260	8,721	29,139
June	82,853	35,657	4,259	20,720
Fiscal year 1925.....	749,393	325,199	77,291	186,939
July	64,642	24,881	3,601	28,586
August	68,489	30,707	3,526	34,168
September	68,445	29,917	3,594	22,709
October	80,045	37,709	11,226	23,054
November	79,771	34,712	6,173	33,238
December	98,400	53,333	7,703	36,908
Calendar year 1925...	943,240	441,425	80,269	265,688
January, 1926	79,067	48,423	3,105	37,421
February	100,273	59,122	5,194	27,239
March	93,107	54,825	4,606	27,391
April	107,636	54,359	6,949	59,666
May	108,731	57,211	3,002	21,633
June	124,215	43,106	5,277	31,315
Fiscal year 1926.....	1,080,781	528,305	64,106	388,407
July	82,411	32,206	1,702	34,133
August	91,578	26,538	4,611	41,076
September	85,484	17,508	2,525	18,167
October	81,830	18,847	4,879	13,331
November	81,259	17,560	6,057	20,091
December	75,559	14,783	8,752	26,971
Calendar year 1926...	1,111,090	445,602	56,809	354,223
January, 1927	63,452	9,326	2,517	50,605
Seven months	557,485	136,768	31,236	204,323

*Not included in "total imports." These figures are for manganese contents of the ore.

United States Imports of Pig Iron, by Countries of Shipment

(In Gross Tons)

	January		December	
	1927	1926	1926	1925
United Kingdom	....	15,833	40	20,148
British India	246	10,859	203	13,552
Germany	5,272	8,395	10,218	9,200
Netherlands	3,700	7,173	3,699	6,075
Canada	....	540	48	662
France	....	4,663	....	1,400
Belgium	....	930	....	2,030
All others	108	30	575	266
Total	9,326	48,423	14,783	53,333

Exports of Iron and Steel from the United States

(In Gross Tons)

	January		Seven Months Ended January	
	1927	1926	1927	1926
Pig iron	3,734	1,663	19,826	23,134
Ferromanganese	55	30	468	1,446
Ferrosilicon	.....	.....	.....	.....
Scrap	3,735	6,397	46,167	45,873
Pig iron, ferroalloys and scrap	*7,524*	*8,090*	*66,461*	*70,453*
Ingots, blooms, billets sheet bar, skelp	3,212	3,208	74,993	59,410
Wire rode	2,319	1,180	12,223	9,441
Semi-finished steel	*5,531*	*4,388*	*87,216*	*68,851*
Steel bars	12,327	11,070	82,041	67,247
Alloy steel bars	490	463	2,861	1,848
Iron bars	422	194	2,455	2,023
Plates, iron and steel	10,470	9,102	80,476	59,724
Sheets, galvanized	19,474	16,408	109,767	87,963
Sheets, black steel	15,506	13,628	104,430	71,560
Sheets, black iron	1,570	1,709	9,935	10,284
Hoops, bands, strip steel	4,027	4,663	25,150	25,815
Tin plate; terne plate	41,874	21,143	194,310	64,747
Structural shapes, plain material	9,048	10,049	90,250	71,121
Structural material fabricated	4,985	9,278	29,192	49,779
Steel rails	23,287	9,198	139,956	85,291
Rail fastenings, switches, frogs, etc.	3,164	3,996	24,762	22,686
Boiler tubes, welded pipe and fittings	42,300	32,959	199,773	162,005
Plain wire	2,271	2,591	14,140	19,050
Barbed wire and woven wire fencing	2,222	5,442	22,122	39,384
Wire cloth and screening	239	124	1,215	1,162
Wire rope	472	458	2,833	2,509
Wire nails	770	932	6,225	6,613
Other nails and tacks	647	751	3,772	5,344
Horseshoes	37	48	370	420
Bolts, nuts, rivets and washers, except track	1,002	1,004	7,151	9,544
Rolled and finished steel	*196,734*	*155,229*	*1,164,986*	*866,119*
Cast iron pipe and fittings	1,773	2,481	16,885	19,966
Car wheels and axles	1,115	2,119	9,227	10,751
Iron castings	770	699	5,130	6,546
Steel castings	421	257	2,327	1,858
Forgings	211	148	1,346	1,155
Castings and forgings	*3,290*	*5,804*	*35,915*	*40,276*
All other	1,156	1,083	7,849	7,589
Total	215,235	174,595	1,361,527	1,053,288

ond largest item was cast iron pipe, with a total of 9534 tons, France being credited with 7922 tons and Belgium with 1612 tons. Of the 2946 tons of hoops, bands and cotton ties imports in January, 1467 tons came from Belgium and 1287 tons from Germany.

Taking 56,125 tons, Canada was by far the principal destination of exports in January, while Japan ranked second, taking 26,651 tons. Exports for the month to North and Central America and the West Indies totaled 78,597 tons; to South America, 56,008 tons; to Europe, 17,293 tons; to the Far East, 61,005 tons and to Africa, 2332 tons.

January exports were marked by unusually heavy shipments of boiler tubes and welded pipe, with 42,300 tons, the greatest item of exports for the month, and tin plate, with a total of 41,874 tons, the second largest item exported. Black welded pipe exports amounted to 10,676 tons, widely scattered over the world. The principal shipments of this item by countries included Colombia, 3048 tons; Japan, 1639 tons; United Kingdom, 1372 tons; Mexico, 1040 tons; Portuguese East Africa, 653 tons; Canada, 541 tons and Venezuela, 380 tons. Exports of galvanized welded pipe in January totaled 4609 tons, also widely distributed among foreign markets. Venezuela took 1069 tons; Colombia, 684 tons; United Kingdom, 554 tons; Brazil, 341 tons; Cuba, 317 tons and Trinidad and Tobago, 300 tons.

Japan was the largest consumer of American tin plate for both January and the seven months ended January, taking 9338 tons and 34,464 tons, respectively. Argentina was the second largest market for tin plate in January, taking 6682 tons, while Canada was third, taking 4173 tons. Canada was second for the seven-month period, taking 30,974 tons. It is interesting to observe that the United Kingdom was the fourth largest buyer of American tin plate in January, taking 2186 tons.

Exports of galvanized sheets in January totaled 19,474 tons. The Philippine Islands took 2735 tons; Cuba, 2293 tons; Canada, 2205 tons and Argentina, 1670 tons. Of the 15,506 tons of black steel sheets exported, Japan took 7873 tons and Canada, 6111 tons. Rails amounting to 23,387 tons were exported in January, Brazil taking 7085 tons; Japan, 3965 tons and Canada 3169 tons.

Beginning with January of the present year, statis-

Imports of Iron and Steel Products Into the United States, by Countries of Origin

(In Gross Tons)

From	January, 1927	January, 1926	December, 1926
Austria	48	21	67
Belgium	19,092	12,945	18,140
Czechoslovakia	60	545	476
France	11,927	7,721	10,354
Germany	17,347	12,101	21,044
Italy	22	.....	139
Netherlands	4,521	8,989	5,226
Norway	6	24	4,132
Sweden	1,284	1,996	2,767
United Kingdom	2,867	18,261	1,912
Other Europe	.....	1,531	2
Europe	*57,174*	*64,134*	*64,259*
Canada	5,471	5,387	9,929
Panama	19	.....	.....
Cuba	.....	16	1,061
Mexico	.....	34	70
Dominican Republic	15	62	.....
India	771	9,329	203
Hongkong	1	.....	.....
Japan, including Chosen	1	1	1
All others	.....	104	36
Total	63,452	79,117	75,559

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	January, 1927	January, 1926	December, 1926
North and Central America and the West Indies	*78,597*	*80,396*	*74,781*
Canada and Newfoundland	56,213	55,030	52,279
Cuba	6,918	7,191	10,746
Mexico	7,975	6,291	6,627
Guatemala	531	3,969	266
Salvador	425	3,460	423
Panama	1,022	1,208	955
Other Central America	1,569	862	960
British West Indies	1,717	754	1,284
Other West Indies	2,227	1,631	1,241
South America	*56,008*	*39,167*	*46,418*
Argentina	11,540	9,182	6,450
Brazil	13,168	2,738	9,687
Chile	1,935	7,611	5,318
Colombia	12,713	7,219	10,419
Peru	974	4,759	2,931
Venezuela	13,505	6,944	10,310
Other South America	2,173	714	1,303
Europe	*17,293*	*10,476*	*17,590*
France	459	2,280	1,459
Italy	1,039	904	739
Rumania	593	454	170
Russia	14	2,698	203
Turkey	560	49	19
United Kingdom	10,358	3,179	10,275
Other Europe	4,270	912	4,725
Far East	*61,005*	*43,133*	*58,634*
Australia	3,963	1,621	6,289
British Malaya	2,745	1,250	1,500
China	8,786	3,025	6,669
Dutch East Indies	6,744	3,944	3,704
India	4,323	5,891	1,661
Japan and Chosen	26,651	21,628	32,806
Kwangtung	311	10	246
Philippine Islands	4,367	5,466	3,949
Other Asia and Far East	3,115	298	1,810
Africa	*2,332*	*1,413*	*766*
British South Africa	769	985	495
Egypt	398	207	173
Portuguese East Africa	881	137	4
Other Africa	284	84	94
Total	215,235	174,585	198,189

Sources of American Imports of Iron Ore

(In Gross Tons)

	January		Seven Months Ended January	
	1927	1926	1927	1926
Canada	338	517	12,475	4,972
Cuba	42,000	50,000	322,500	298,612
Chile	110,300	119,300	787,700	740,000
Spain	.....	15,780	13,393	47,897
Sweden	22,973	.....	61,657	105,744
French Africa	29,900	15,600	182,439	78,675
Other countries	89,969	1,135	228,817	38,428
Total	295,480	202,332	1,608,981	1,314,328

Imports of Iron and Steel Into the United States

(In Gross Tons)

	January		Seven Months Ended January	
	1927	1926	1927	1926
Pig iron	9,326	48,423	136,768	259,682
Ferromanganese*	1,201	2,631	21,894	36,681
Ferrosilicon	957	424	8,790	2,197
Ferrochrome	359	50	552	.....
Scrap	5,920	2,961	60,719	52,508
Pig iron, ferroalloys and scrap	*17,763*	*54,489*	*228,723*	*351,068*
Steel ingots, blooms, billets and slabs	944	1,939	12,721	11,262
Iron blooms, slabs, etc.	.....	.....	306	779
Wire rods	1,512	1,173	6,697	4,756
Semi-finished steel	*2,456*	*3,112*	*19,724*	*16,797*
Rails and splice bars	2,744	1,435	29,027	15,097
Structural shapes	11,363	5,093	84,641	40,012
Boiler and other plates	452	271	2,321	973
Sheets and saw plates	1,646	709	9,004	2,276
Steel bars	6,560	6,729	55,601	37,225
Bar iron	632	64	3,114	3,950
Hoops, bands and cotton ties	2,946	921	20,469	5,737
Tubular products (wrought)	5,146	2,251	24,694	22,276
Nails, tacks, staples	526	22	3,964	2,305
Tin plate	23	2	241	258
Bolts, nuts, rivets and washers	21	1	142	55
Round iron and steel wire	185	287	2,536	2,422
Barbed wire	459	920	1,367	4,753
Flat wire; strip steel	344	216	2,277	1,328
Steel telegraph and telephone wire	23	....	1,069	133
Wire rope	117	52	1,422	735
Other wire	21	162	458	569
Wire cloth and screening	48	12	272	232
Rolled and finished steel	*33,256*	*19,137*	*242,620*	*140,337*
Cast iron pipe	9,534	2,005	64,606	36,966
Castings and forgings	443	264	1,812	1,651
Total	63,452	79,117	557,485	546,819
Manganese ore*	50,605	37,421	204,323	221,036
Iron ore	295,480	202,332	1,600,937	1,220,108
Magnesite (dead (burned)	.....	13,336	20,459	29,989

*Manganese content only, except shipments of ore from Cuba, which are stated in gross weight. Imports from that country in January, 1927, amounted to 34,449 tons.

tics of the Department of Commerce were transposed to the calendar year basis exclusively. Previously figures were shown for both the fiscal and calendar years. The change was made upon the recommendation of commodity division chiefs and others on the ground that business largely is done on the calendar year basis and that the fiscal year is being gradually discarded.

As a result of the change, figures prepared by the Division of Statistics beginning with January showed a comparison of exports and imports for the six months ended with December, 1926, and December, 1925, instead of the seven months ended with January, 1927, and January, 1926. The change was made without advance public announcement, which, it was stated, had been overlooked. The result of the change will mean that when export and import returns for February are made, they will show comparison only for that month of the present and last year, together with the January-February period of the two years.

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,333	438,462	1,468,020
*Average, 1919 to 1923...	3,078,724	123,837	149,218
Calendar year 1924.....	1,805,073	41,478	114,417
January, 1925	141,777	1,298	5,764
February	102,299	1,413	7,516
March	155,384	2,037	7,951
April	155,375	1,632	6,831
May	150,612	2,316	7,360
June	136,847	2,507	7,804
Fiscal year 1925.....	1,663,084	29,563	107,988
July	139,861	2,348	10,701
August	188,465	5,944	8,024
September	136,791	3,349	8,186
October	141,817	2,874	8,432
November	171,134	4,272	16,783
December	142,209	2,626	12,282
Calendar year 1925.....	1,762,571	32,674	108,681
January, 1926	174,585	1,663	4,388
February	157,187	1,478	5,615
March	169,438	1,489	6,050
April	194,449	2,010	7,167
May	173,418	1,107	9,880
June	159,506	1,369	5,714
Fiscal year 1926.....	1,948,860	30,587	103,271
July	194,717	2,595	14,558
August	171,588	3,744	14,437
September	182,071	2,173	12,569
October	172,070	2,205	13,983
November	219,830	3,724	17,528
December	198,189	2,651	10,412
Calendar year 1926.....	2,167,048	25,208	120,602
January, 1927	215,235	3,734	5,531
Seven months	1,361,527	19,826	87,216

*Calendar years.

Swedish Exports and Imports Declined In 1926 But Output Increased

STOCKHOLM, SWEDEN, Feb. 8.—Export, import and iron and steel production figures for 1926 have been announced by the Swedish Iron and Steel Federation (Jernverksforeningen). Pig iron output of about 456,000 metric tons exceeded 1925 by about 24,000 tons, and steel production of about 459,000 tons exceeded 1925 by about 11,000 metric tons.

Exports of iron and steel last year totaled 242,000 metric tons, compared with 248,900 tons in 1925. Included in these exports was 154,000 tons of finished and semi-finished products. Of the pig iron exported 84 per cent was special or charcoal iron. Imports of iron and steel totaled 299,900 tons, included in which was 62,000 tons of pig iron.

At the end of 1926 there were 36 blast furnaces in operation, 35 furnaces producing Lancashire iron and 29 open-hearth furnaces.

British Used Less Non-Ferrous Metals in 1926

WASHINGTON, March 1.—British consumption of the four major metals, copper, tin, lead and zinc, showed a decline in 1926, as compared with the preceding year, with the exception of copper, according to statistics issued by the statistical department of the London Metal Exchange, says a report to the Department of Commerce from Trade Commissioner H. S. Fox, London. The apparent consumption of copper in the United Kingdom, however, has increased steadily over the past several years, the total during 1926 amounting to a little over 122,000 gross tons, an increase of about 7000 tons over 1925, and nearly five times that of 1922.

In the case of the other three major metals, the largest percentage decline in consumption was in tin, which was to have been expected in view of the industrial depression due to the coal strike, which affected materially the operations of the tin plate works. Total British consumption of this metal last year amounted to 18,296 tons, a decrease of about 26 per cent from the corresponding figure in 1925. The consumption of tin last year was lower than that of any year for the past five years. The decline in the requirements of zinc and lead, especially in the case of lead, were comparatively small, and the consumption was larger than in any of the last few years, except 1925.

Data on World Steel Industry for 1925

The annual compilation of statistics of the iron and steel industries of the world, which the National Federation of Iron and Steel Manufacturers issues each year, has just been made public, covering data for 1925. The pamphlet of 111 pages is entitled, "Statistics of the Iron and Steel Industries," and covers in the usual detail the production of the United Kingdom, United States, France, Germany, Belgium, Luxemburg, Sweden, Italy, Spain, Poland, Japan, Canada, India and Australia. In most cases, data covering pig iron, steel and rolled steel output, as well as imports and exports, are given, including the figures for a number of years previous to 1925. A copy of this valuable publication can be obtained for 5s. 4d., post free, from the National Federation of Iron and Steel Manufacturers, Caxton House, Tothill Street, Westminster, London, England.

Larger Proportion of Skilled Artisans In Incoming Flow of Aliens

WASHINGTON, Feb. 26.—Changes in the occupational character of immigration since the war are discussed in an article in the February issue of the *Monthly Labor Review*. Although it is a matter of general knowledge that, since the war, and more particularly since the passage of the "quota" immigration acts of 1921 and 1924, there has been both a great reduction in the immigration of aliens into the United States and a marked change in the racial composition of such immigration, it is not so well known that there has been an equally significant change in the occupational character of the immigration.

The proportion of unskilled labor has decreased sharply, this class of labor being represented by about 41 per cent of all immigrants in the four pre-war years 1911 to 1914, and by only 18.7 per cent in the two years 1925 and 1926. In the earlier period the unskilled laborers outnumbered, more than two to one, the total number of skilled mechanics, professional and business people, and farmers; while in the past two years the average number of skilled laborers was substantially as great as that of the unskilled, and the average annual number of immigrant farmers was actually larger than in the pre-war period.

The international convention of the Amalgamated Association of Iron, Steel and Tin Workers of North America will be held in Granite City, Ill., for a period of two weeks, beginning April 5.

Machinery Exports Show a Slight Gain

January Movement Best Since September, But Less Than a Year Ago—Imports Continue Heavier Than in Recent Years

WASHINGTON, Feb. 28.—Exports of machinery of all kinds in January were valued at $33,433,434, against $32,140,569 in December. Exports of industrial machinery, as classified by the Division of Statistics, Department of Commerce, were valued at $17,564,787, compared with $15,484,221 in December. As classified by the Industrial Machinery Division, however, exports of this kind of equipment were valued at $14,946,842, compared with $13,697,415 in December and with $13,434,223 in January, 1925, and were the largest for any month with a single exception, since 1921.

For the seven months ended January, 1927, exports of all kinds of machinery were valued at $229,442,498, against $228,851,343 for the corresponding period one year ago. Exports of industrial machinery as classified by the Division of Statistics were valued at $109,530,296 for the seven months ended January, 1927, against $107,288,558 for the seven months ended January, 1926. Exports of power-driven metal-working machinery in January, 1927, were valued at $1,495,455 compared with $1,206,125 in January of last year. For the seven months ended January, 1927, and January, 1926, the respective values of this class of machinery were $8,831,832 and $10,272,151.

Imports of machinery carried in THE IRON AGE table were valued at $1,448,670 in January, 1927, against $1,685,580 in the corresponding month of 1926. For the seven months ended January, 1927, and January, 1926, the values were $9,389,254 and $6,617,728, respectively. Imports of industrial machinery in January were valued at $1,423,842, against $1,736,490 in January, 1926.

The Industrial Machinery Division in two charts showed the monthly export experience of the United States in industrial machinery since 1921. One chart based on monthly shipments discloses how greatly this trade varies throughout the year. The other chart, based on three-month moving averages, indicates more clearly the general trend.

The largest export gains in industrial machinery occurred in power-generating, metal-working and miscellaneous equipment. In the power-generating group the greatest activity was manifested in shipments of steam engines, exports rising from $729,328 in January, 1926, to $1,120,302 for January, 1927. Under

Machinery Exports from the United States
(By Value)

	January, 1927	January, 1926	Seven Months Ended January, 1927	Seven Months Ended January, 1926
Locomotives	$1,132,627	$897,758	$3,579,760	$4,579,765
Other Steam Engines	285,073	90,477	1,132,613	732,502
Boilers	270,885	185,622	1,212,105	1,112,656
Accessories and Parts	32,827	132,670	330,069	1,334,392
Automobile Engines	677,999	956,283	4,964,833	6,585,079
Other Internal Combustion Engines	585,001	789,030	5,458,725	4,385,566
Accessories and Parts	344,532	270,458	2,367,343	2,285,308
Electric Locomotives	13,844	88,954	1,101,780	642,412
Other Electric Machinery and Apparatus	729,211	642,803	4,595,585	4,187,706
Excavating Machinery	324,987	357,089	2,305,953	3,008,250
Concrete Mixers	110,500	57,735	462,849	503,897
Road-Making Machinery	112,352	168,734	820,736	885,559
Elevators and Elevator Machinery	341,751	166,488	2,977,849	1,175,523
Mining and Quarrying Machinery	1,136,219	1,511,640	7,797,811	7,043,146
Oil-Well Machinery	1,977,615	1,821,354	10,246,795	7,329,756
Pumps	592,080	518,753	3,630,808	3,641,005
Lathes	184,347	205,060	1,036,825	1,686,963
Boring and Drilling Machines	80,628	52,927	578,546	353,657
Planers, Shapers and Slotters	52,639	26,512	245,274	243,214
Bending and Power Presses	105,785	66,802	928,347	369,135
Gear Cutters	34,327	15,383	233,437	417,820
Milling Machines	108,114	81,336	581,771	878,004
Thread-Cutting and Screw Machines	78,244	54,908	460,589	703,682
Forging Machinery	105,875	61,578	588,655	170,309
Rolling Machinery	69,948	38,707	155,969	38,907
Sharpening and Grinding Machines	274,029	122,307	1,247,936	1,281,040
Other Metal-Working Machinery and Parts	352,105	449,307	2,623,676	2,649,689
Textile Machinery	2,003,061	1,255,855	12,392,266	7,498,304
Sewing Machines	773,481	521,790	5,098,765	4,815,356
Shoe Machinery	99,021	112,025	771,871	727,050
Flour-Mill and Gristmill Machinery	46,565	64,332	413,540	485,472
Sugar-mill Machinery	164,660	204,489	2,835,428	6,117,392
Paper and Pulp-Mill Machinery	585,911	262,452	2,059,223	1,299,116
Sawmill Machinery	79,001	61,104	489,117	478,318
Other Woodworking Machinery	113,455	115,262	667,036	826,020
Refrigerating and Ice-Making Machinery	514,048	251,405	3,105,291	1,709,449
Air Compressors	325,142	393,761	2,488,132	2,359,061
Typewriters	1,651,098	1,794,760	9,823,203	10,512,497
Power Laundry Machinery	80,096	100,619	502,937	843,663
Typesetting Machines	323,633	361,812	2,231,749	2,079,640
Printing Presses	471,005	711,143	3,204,722	2,847,425
Agricultural Machinery and Implements	4,631,499	8,451,370	42,102,141	50,359,190
All Other Machinery and Parts	11,458,215	10,097,830	79,500,439	77,908,648
Total	$33,433,434	$34,590,693	$229,442,498	$228,951,343

Imports of Machinery Into the United States

	January		Seven Months Ended January	
	1927	1926	1927	1926
Metal-working machine tools	$33,570	$42,024	$302,923	$222,054
Agricultural machinery and implements	336,044	238,545	2,049,756	1,393,772
Electrical machinery and apparatus	75,862	91,928	469,273	598,226
Other power generating machinery	864	553	3,713	4,204
Other machinery	850,727	1,131,717	5,226,997	3,229,643
Vehicles, except agricultural	151,603	180,813	1,336,592	1,169,829
Total	$1,448,670	$1,685,580	$9,389,254	$6,617,728

United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Power-Driven Metal-Working Machinery
The year 1924	$317,040,424	$9,711,618	$8,644,444
1925			
January	28,117,952	803,829	845,986
February	23,215,776	814,703	707,445
March	33,932,473	999,237	1,364,930
April	33,468,086	1,167,099	1,694,761
May	32,164,865	861,655	1,220,914
June	27,121,123	935,487	1,003,325
Fiscal year	325,578,294	10,404,337	14,011,404
July	32,320,533	905,872	1,188,069
August	38,768,822	747,912	1,308,372
September	30,719,342	956,250	989,379
October	31,271,007	996,557	905,826
November	30,034,814	876,113	1,007,376
December	37,933,511	1,448,316	1,155,660
The year 1925	385,376,676	11,577,911	13,052,916
1926			
January	34,590,693	1,659,971	1,206,125
February	32,269,707	1,469,170	1,294,934
March	35,241,960	1,567,912	1,297,616
April	38,755,467	1,814,021	1,479,337
May	32,707,863	1,494,156	1,004,298
June	30,498,054	1,484,127	1,024,252
Fiscal year	398,306,436	15,413,144	16,046,267
July	34,123,992	1,327,874	1,318,556
August	32,459,844	1,453,909	1,326,443
September	36,901,003	1,432,378	1,145,406
October	27,965,148	1,247,115	1,069,343
November	32,694,793	1,210,868	1,274,446
December	22,140,569	1,373,234	1,202,069
The year 1926	400,167,833	17,137,056	14,315,695
1927			
January	33,433,434	1,448,670	1,495,455
Seven months	229,442,498	9,389,254	8,831,832

the classification of the Division of Statistics, exports of locomotives in January, 1927, were valued at $1,132,627, and of "Other Steam Engines" at $285,073. The number of locomotives exported was 41, of which 20, valued at $778,000, went to South American countries other than Brazil, the latter country taking eight, valued at $184,620.

Total shipments of metal-working machinery in January were valued at $1,847,560, or nearly $191,000 more than the total for January, 1926, according to the Industrial Machinery Division listing. Exports of miscellaneous industrial machinery reached the large total of $5,262,427 in January of the present year, compared with $3,550,081 for the corresponding month of 1926, representing a gain of $1,712,000 or 49 per cent. Shipments of paper and pulp-mill machinery increased from $262,452 to $585,911. Oil well machinery increased from 1,821,354 to $1,977,615. Agricultural machinery and implements showed a decline of almost 50 per cent, dropping to $4,631,499 from $8,451,370.

Of the 23,183 sewing machines, valued at $773,481, exported in January of the present year, 3594, valued at $234,695, were for industrial use. Typewriters to the number of 28,805, valued at $1,651,098, were exported in January, the United Kingdom continuing as the leading market, taking 6604, valued at $386,301. Argentina took 1989, valued at $120,478; France, 1672, valued at $106,779; Germany, 1579, valued at $87,459; and Czechoslovakia, 1072, valued at $76.408.

WESTERN FOUNDRY CONFERENCE

Temperature Gradients and Slag Analysis Among Topics Discussed at Wisconsin Meeting

CURRENT problems and research developments in the steel, malleable, gray iron and non-ferrous foundries were discussed at the first annual Foundry Conference held at the laboratories of the University of Wisconsin, Madison, Wis., Feb. 1 to 4. The conference was arranged in accordance with a policy of cooperation with the industries of the State initiated three years ago by the College of Engineering of the University of Wisconsin.

Seventy-eight representatives of 61 foundries in the States of Wisconsin, Minnesota, Illinois, Iowa, Ohio, Michigan and Massachusetts, as well as engineers and metallurgists of the university, took part in the conference. Prof. R. S. McCaffery of the department of metallurgy, University of Wisconsin, was in general charge, with the cooperation of the College of Engineering and the university extension division.

Features of the conference were an address by President Glenn Frank of the university; a steak supper on Tuesday and a "brickbat and bouquet" banquet on Thursday evening; noon luncheons in which the men met informally at the University Club during each day of the sessions; a motion picture, followed by discussion, showing the triplex process of producing electric steel; demonstrations in the materials testing laboratory; and inspection trips to the plants and foundries of the Gisholt Machine Co., manufacturer of machine tools, and the Madison-Kipp Co., manufacturer of lubricators.

Speakers at general meetings and leaders of round-table discussions were:

R. S. McPherran, Allis-Chalmers Mfg. Co., Milwaukee; H. W. Dietert, United States Radiator Corporation, Detroit; William S. Ford and A. E. Murphy, William S. Ford & Co., engineers, Milwaukee; C. A. Busche, Prime Mfg. Co., Milwaukee; W. J. McNeill, Federal Malleable Co., West Allis, Wis.; A. T. Baumer, Milwaukee Steel Foundry Co., Milwaukee; C. I. Wesley, Wesley Steel Treating Co., Milwaukee; Carl Johnson, Gisholt Machine Co., Madison; and the following professors of the University of Wisconsin: F. E. Turneaure, dean College of Engineering; R. S. McCaffery and J. F. Oesterle, department of metallurgy; W. H. Dudley, university library; and S. W. Gilman, department of economics.

A condensed summary of the discussions, with the conclusions brought out, follows. Those concerning temperature gradients and slag analysis deserve special note, as they represent the hitherto unpublished results of important research now being carried out by Professor McCaffery.

Foundry Practice Section—Prof. R. S. McCaffery

1. The temperature gradient during melting has an important influence—not generally recognized—in the final composition of the metal.
2. The slag and its changes in viscosity, color and appearance give the most definite, most easily available and quickest indication of changes in the melt, particularly as to rate of oxidation and elimination of impurities.

Molding and Core Sand Section—H. W. Dietert

1. Permeability, strength and moisture tests, using methods and equipment recently developed, establish an acceptable basis for selecting molding and core sands for typical classes of foundry work.
2. Control of sands in the foundry is one of the most promising methods of reducing casting losses.
3. Sand-handling equipment results in important economies by increasing the efficiency of the molder.
4. Gating of castings by definite formula summarizes the experience of the practical foundryman in terms of relation between weight and pouring time, size of gate, and rate of pouring.

Cupola Section—R. S. McPherran

1. High-test cast iron, particularly nickel alloys, is becoming increasingly important because of industrial demand for higher tensile strengths and ability to withstand heat.
2. Hot-blast cupolas, as installed by the Griffin Wheel Co., Chicago, result in fuel savings as high as 20 per cent on continuous operation; the advantage is less important for short runs.
3. The greatest possibility of reducing defects in castings lies in more accurate knowledge of methods of control in melting and molding.
4. The annealing of cast iron, for greater machineability and relieving strains, is becoming as important as in the case of steel.
5. Hydraulic cleaning of castings, as developed by the Allis-Chalmers Mfg. Co., removes the greatest menace to the health of foundry workers and results in economy by reducing labor turnover.
6. Physical testing of fire brick, by rattling and temperature-under-load tests, gives an indication of service life before bricks are built into cupolas.

Steel Section—A. T. Baumer

1. Improper design often makes economical production of castings impossible. A committee of foundrymen and designers to be arranged for at a future date will take up the interrelation of design and foundry practice.
2. Heat-treating by electric furnace is increasing, largely because of certainty of control.

Cost Accounting Section—W. S. Ford and A. E. Murphy

1. Where time studies are undesirable, the point system is a valuable method of determining piece rates.
2. To make possible the intelligent comparison of foundry costs a standardized cost system is imperative.

Since most of the men attending indicated that they would come to similar meetings in the future and bring other men from their organizations with them, action was taken to hold conferences annually, with provision for increased attendance. Plans for the 1928 conference, therefore, are already under way.

Farm Machinery Demands Become More Exacting

WASHINGTON, March 1.—In a report issued by the Department of Agriculture more than 400 specific suggestions for experimental research relating to mechanical farm equipment have been listed. The rapid increase in the use of mechanical equipment by agriculture has developed many problems which a decade or two ago were practically unthought of, or which were at that time relatively unimportant, the report says. It is pointed out that modern agriculture has become an industry of which machinery is of primary importance, and so exacting are requirements becoming, it is stated, that manufacturers of modern farm machines are finding it difficult to meet intelligently the increasing needs of the agricultural industry for specific machines.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Favorable and Unfavorable Factors Affecting Business May Be Summarized as Follows:

Favorable Factors

1. Easy money; high Federal Reserve ratio.
2. Large volume of retail trade in urban territory.
3. January bank debits gained.
4. Seasonal gains in the iron and steel and automobile industries.
5. Strong financial position of most leading companies.
6. Light mercantile inventories.
7. Prevalence of caution.

Unfavorable Factors

1. Declining building activity.
2. Declining commodity prices.
3. Less favorable automobile outlook.
4. Low farm prices and poor agricultural purchasing power.
5. Decline in mail order sales.
6. Declining employment in factories.
7. Large manufacturers' inventories.
8. Low unfilled orders.
9. Increasing business failures and declining new enterprises.
10. Increasing European competition; declining exports.

SEASONAL gains are occurring in a number of basic industries, but conditions are moderately unfavorable on balance, and further declines are to be expected after the spring months.

RAILROAD freight traffic furnishes the first comprehensive indication concerning the trend of industrial activity in 1927. The tonnage hauled by the railroads in January, while larger than a year ago, was considerably lower than in December, taking seasonal conditions into consideration. Our adjusted index for January was 135.1 per cent of the 1921 average, against 146.7 per cent in December, and 125.3 per cent a year ago. *This is the sharpest decline, making due allowance for the usual seasonal changes from month to month, that has occurred since June, 1924. And it is the more notable because of the heavy movement of bituminous coal,* which has been chiefly responsible for keeping the weekly car loadings during January and February above those of a year ago.

It seems reasonably clear that so sharp a drop in tonnage indicates a change in trend, and, while some recovery may develop in February or March, it probably will be but temporary and due to the coal situation. The volume of freight traffic is likely to show a moderate but general downward trend in 1927, as it showed an irregular, gradual, upward trend during 1926.

Earnings statements of the carriers in December were quite spotty and, aside from the coal roads, compared unfavorably with December, 1925. The reports received thus far for January make much the same showing.

Bank Debits Indicate Speculation

The other general index of industry followed in this department is bank debits. This reflects the volume of business transactions in terms of money. Bank debits increased in December and again in January, taking seasonal conditions into consideration, but the January volume was appreciably below the high points reached in March and August, 1926. At this writing the weekly bank debits so far in February have been well sustained, owing partly to the heavy volume of speculation on the New York Stock Exchange.

Debits are now far above a normal relation with the physical volume of trade, which is an unsound condition. It indicates that trading and speculation are outrunning the physical volume of commodities produced and shipped. The indications, moreover, are that both of these important indexes have passed their peaks and that the trend of the business cycle will be clearly downward before many months have passed.

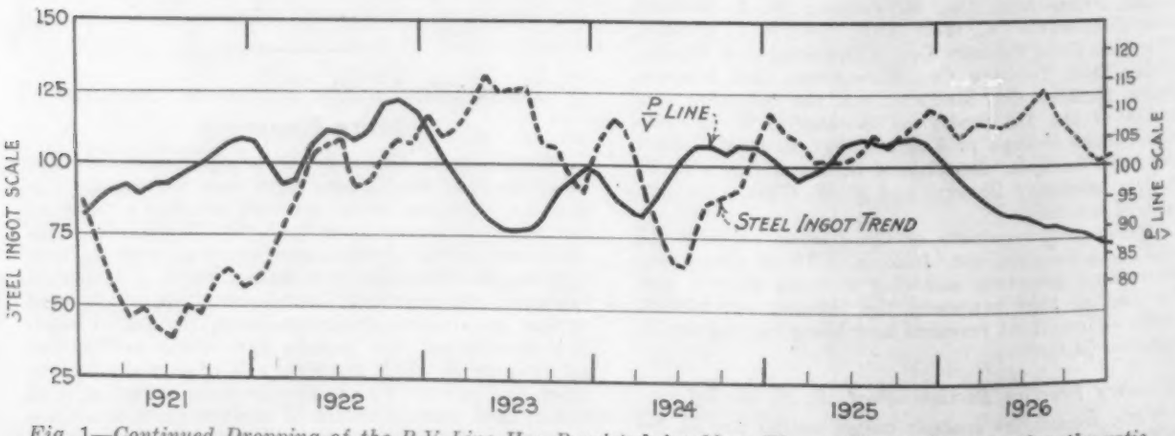


Fig. 1—Continued Dropping of the P-V Line Has Persisted for More Than a Year. Representing the ratio between commodity prices and the physical volume of trade, it generally anticipates the trend of business by about five months. The steel ingot curve, after a sharp recession in activity, has had a slight recovery

In This Issue

Suggests a new theory of metallic hardening.—Grain boundaries owe their special properties to a forced molecule formation, due to separated atoms taking on electrons, some pairs of atoms sharing the same electrons.—Page 633.

When a "green" ingot is cogged down, the segregated material is no longer found in its accustomed place.—The rolling operation causes the molten material to permeate the interstices of the loosely coherent crystals on the inside of the section.—Page 640.

Brass foundry suspends flask weights on overhead trolley.—By moving a lever, the weights are placed on the molds and raised again when pouring is finished.—Page 636.

Domestic wages may decline unless foreign wages rise, says Campbell.—Competition from abroad will inevitably bring about an adjustment.—Page 648.

P-V Line indicates a weakening demand and sagging commodity prices.—Dr. Haney forecasts a clearly downward trend before many months have passed.—Page 654.

Welded steel parts will tend more and more to replace castings, says welding equipment manufacturer.—For such uses as machine bases welded steel is said to be lighter, cheaper and stronger.—Page 645.

February daily pig iron output was 4.8 per cent above January.—Production averaged 104,934 gross tons, a gain of 4811 tons, and was higher than February, 1926. Number of furnaces in blast March 1 was 217, a gain of 9.—Page 665.

Beryllium-copper alloys have exceptional tensile strength.—They hot-roll well and can be readily cold-drawn. Their ability to withstand the kink test suggests their use for springs, wires and high-strength conductors. Page 632.

Keen competition forces many malleable foundries to close down.—Thus excess productive capacity, promoted by wartime needs, is brought nearer to demand, which may improve prices.—Page 634.

Produces wood grain on steel by photographic process.—The real wood is photographed; then a flat graining plate is made of copper. From this the grain is taken on a roll and transferred to the steel.—Page 641.

Cuts lead specimens for microphotographing, by use of sharp knife.—Specimens are free of scratches and surface work, so that a slight etching reveals the true structure of the metal.—Page 633.

Aluminum alloys should be poured from **under** *the skin.*—Molten aluminum always has a surface film which is insoluble in the underlying metal. Pouring from under the skin will prevent this film from entering the ingot.—Page 633.

Can steel mills without blast furnaces buy power more cheaply than they can produce it?—No steel plant is economically justified in installing a generating plant unless it can thereby use fuel that would be otherwise wasted, power plant engineer declares.—Page 635.

Shall joints be welded or riveted?—Too much depends upon the skill of the welder, says rivet advocate. Welded joints can be constructed which will develop full strength of the structural member, producing absolute fixation, welding proponent declares.—Page 645.

Our exports of iron and steel are increasing, and our imports decreasing.—January exports were higher than for any other month in three years, with a single exception. Imports were lowest in more than two years.—Page 649.

Mounting bank debits indicate speculation.—Debits are now far above a normal relation to physical volume of trade, Dr. Haney points out. This denotes that trading and speculation are outrunning actual output of commodities.—Page 654.

Creating backlogs by price-cutting is harmful and futile.—Making price concessions to secure an accumulation of orders in preparation for a price advance, tends to defeat its own purpose by removing the consumer from the market during the very time when the advance is being tested. And when the consumer is ready to buy again the difference between the cut and the advanced prices give the impression of a double rise.—Page 648.

Skilled labor finds United States its Mecca.—Ten or twelve years ago unskilled immigrants outnumbered the skilled by 2 to 1. Now the skilled labor coming into the country equals the unskilled.—Page 651.

CONTENTS

March 3, 1927

Wire Company Seventy Years Old 627

Non-Ferrous Developments Marked 631

Rearranging a Brass Foundry 636

Reversing Blooming Mill Practice 638

Exports Higher; Imports Lower 649

Large Gain in February Iron Output 665

Machine Tool Buying Hand-to-Mouth...630
Production of Malleable Castings 1,000,000 Tons 634
Use of Power in American Steel Mills...635
Flexible Tariff Upheld 640
Wood Grain Reproduced on Steel.....641
Strength of Ore and Top Rock.....644
Structural Welding and Riveting.....645
History of Beam Depths.....647
Mexican Tariff Higher 647
Buys Norton and Ashland Plants.....647
Merger of Ohio Fabricating Companies.647
Parker Rust-Proofing Process 647
Estimates 1927 Steel Output at 90 Per Cent of 1926 648
Metallurgical Books in Plant Library...648
Composition of Materials Within a Blast Furnace 648
British Used Less Non-Ferrous Metals..651
Data on World Steel Industry.....651
Skilled Artisans in Incoming Aliens....651
Western Foundries Confer.....653
Elimination of Unnecessary Fatigue....660
Cincinnati Rail-River Terminal Handles First Steel Shipment 660
Turbo-Blowers for Bessemer Converters.660
Pig Iron Tariff Duty Increased.....661

MEETINGS

Institute of Metals Division.....631
Gear Makers to Meet in Jackson, Mich...643
Cost Problems Discussed by Southern Metalworking Manufacturers.....644
Philadelphia Section of the American Welding Society 645
American Society of Mechanical Engineers 660

NEW EQUIPMENT

Boring and Drilling Machine.....642
Oil Filter for Use on Machine Tools....642
Safety Prop for Cupola Doors.....643
Transformers for Electric Furnaces....643
Improved Grinding Equipment Offered..643
Tapered Roller Bearings 644
Adjustable Strap Clamp 644

STATISTICAL

Malleable Castings Tonnage Improves...634
Swedish Exports and Imports.....651
Machinery Exports Show a Slight Gain..652
More Commercial Steel Castings.....659
Increase in Canadian Pig Iron Output..659
Steel Furniture Shipments High.....659
Canadian Coke Production Gained.....660
Blast Furnace Census.....688

DEPARTMENTS

Business Analysis and Forecast.....654
Reinforcing Steel Business.....661
Editorial 662
Iron and Steel Markets.....666
Comparison of Prices.....667
Prices, Raw and Finished Products..669-671
Structural Awards and Projects.....683
Non-Ferrous Metals 684
Railroad Equipment Buying 685
Personals 686
Obituary 687
European Steel Markets.....689
Machinery Markets 692

Is the Blast Furnace to Pass Out?

ARTICLES in THE IRON AGE of Feb. 17 and Feb. 24 have described two radically different methods of producing iron and steel without the use of the blast furnace. Both are of European origin, one having originated in the Netherlands and the other in Norway. Both have been tried out experimentally on a scale large enough to show their practicability. In the one case, a high-tension electric furnace is used in generating gas for reduction in a long retort or kiln. In the other case, a vertical shaft uses baffles to retard the flow of material in its progress from the hopper to the crucible, and thus give the gases a longer time to work upon it. Here, again, electricity plays a large part, for the furnace has five pairs of electrodes located at strategic points.

As recently as 30 years ago, production of Bessemer steel in the United States was considerably more than three times as heavy as open-hearth steel. Last year, open-hearth ingots outstripped Bessemer more than five to one. Is the blast furnace to go into the museum?

For News Summary See Reverse Side

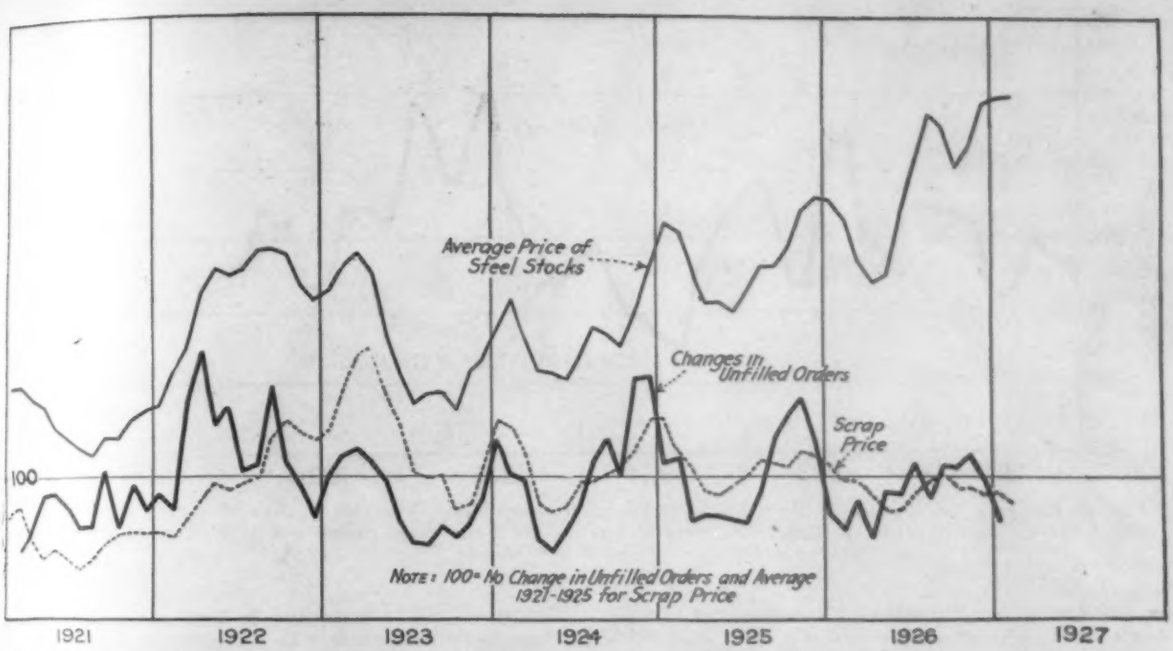


Fig. 2—Changes in Unfilled Orders and the Price of Heavy Melting Steel Both Point Downward, After Allowing for Seasonal Influences. Steel stocks, on the contrary, have reached new high levels, which probably cannot be maintained

The volume of business is high and it is still true that no indications of a sharp decline or of approaching depression have appeared, but increased irregularity and somewhat lower levels seem to lie ahead.

Curtailment Expected, with Lower Prices

OUR P-V line declined further in January, indicating a weakened demand for commodities in general and forecasting both curtailment in industry and sagging commodity prices. On the other hand, production of steel ingots showed a strong seasonal gain in January, though, when allowance is made for the usual seasonal increase in that month, the adjusted curve shown in the first chart makes but a slight rise and the ingot output is little above the estimated normal. The January recovery in ingot production may be considered a reflection of the small hump in the P-V line that came about October (which would have been more pronounced if the abnormal coal output had not developed then).

Leaving all sentiment out of consideration, and sticking to cold statistical relationships such as are revealed in the past performance of the P-V line and the ingot production curve, one would say that the latter might rise a little further in February, but not much, and that thereafter the declining trend would be resumed.

Probably the present period of increased activity in the steel industry is somewhat like that in early 1924 and is not likely to carry through March. Of course, this is leaning heavily on a single statistical barometer, which is always dangerous. But we are inclined to think that the outlook in buildings, automobiles and railroads is not bright enough to warrant much further expansion.

Scrap and Unfilled Orders Point Downward

THE second chart shows the trend of a group of steel stocks, together with two of the chief barometers of the steel industry. It is evident that, in spite of recent strength in the stock market, based partly on recent reports of increased activity in the industry, the steel stocks as a group are making relatively little progress and the curve seems to be tapering off. No reaction has developed at this writing, but the averages are not going ahead at the old rate.

On the other hand, the unfilled orders curve, based on the amount of change from month to month, is

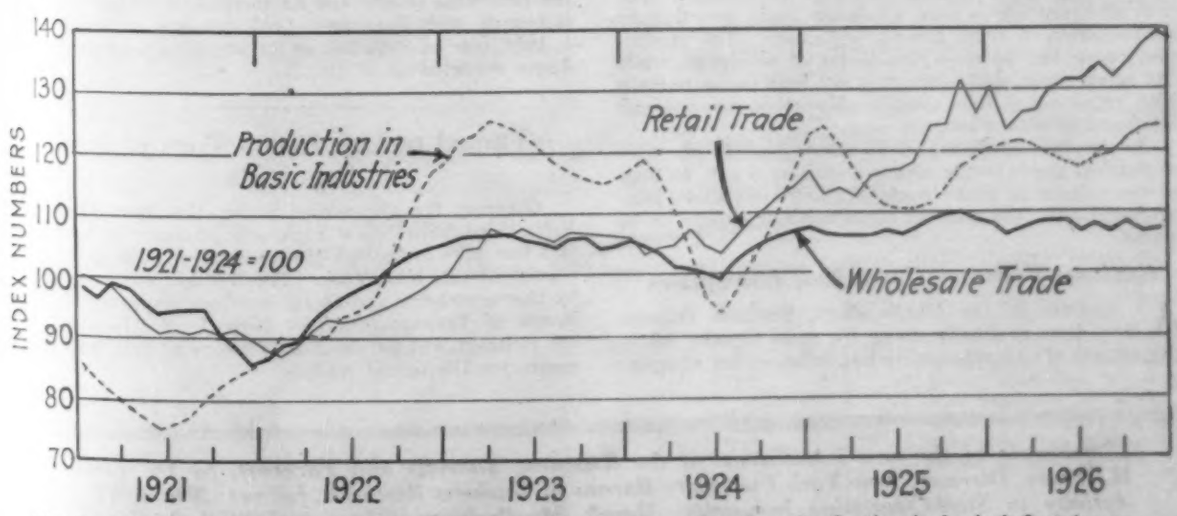


Fig. 3—Retail Trade Volume Has Held High Levels for Many Months. Production in basic industries continues at a rate rarely before reached, indicating that consumption is still large. It has long been above wholesale trade, which is only fairly active

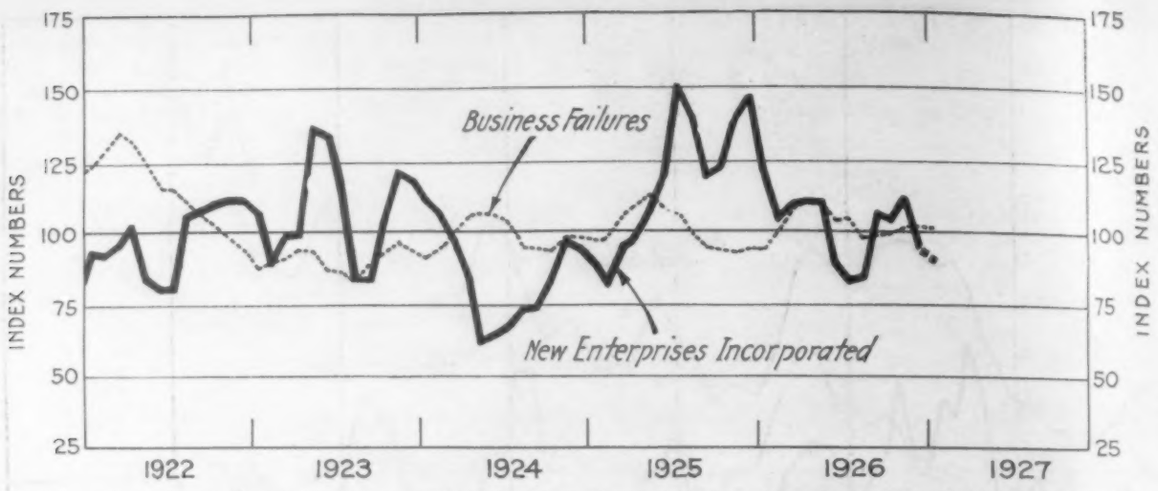


Fig. 4—Business Failures Have Been Slightly Above Normal Since November. New business enterprises are declining sharply from a high level reached late in the Fall. Both curves are plotted as three-month moving averages, to avoid excessive local irregularities

headed downward. The monthly average price of steel scrap at Pittsburgh, after a little recovery which made the January average hold about the same as December, has fallen in February to the lowest point since last June.

It therefore seems to be a statistical probability that steel earnings must decline and that steel stocks will soon react toward lower levels. No one can say that no exceptions exist in such cases, but it is certainly hard to find any period when both of the barometers shown in the second chart have declined, without a corresponding decline in steel stocks.

Trade and Basic Production High

OUR third chart represents a comparison between industrial production and the activity of wholesale and retail trade. It shows that retail trade, while at a very high level, declined a little in January. Wholesale trade is only fairly active and barely steady at a point a little under the level of a year ago. Production in basic industries has not been quite up to the high points reached in 1923 and 1925, and now shows signs of rounding off a little. But it is well above normal and has been sustained by the abnormal rate of production of coal, oil, and copper. It should be noted that each of these indexes has been adjusted so as to eliminate merely seasonal variations.

These comparisons furnish a rough basis for judging the balance of business activity, though it should be remembered that, if prices were considered, the basic production curve would be relatively lower in 1926 than it appears. We may conclude that retail trade is much more active than wholesale trade, and that no accumulation of retail inventories exists. The production curve lies between the levels of wholesale trade and retail trade, and, while it is not high in comparison with retail sales, it is considerably above the average relationship with wholesale sales.

In the last analysis, all business depends on sales of finished goods to the ultimate consumer and, as long as the volume of retail trade continues anywhere near present levels, the general condition will appear to be sound.

Business Failures Above New Enterprises

AS appears in the fourth chart, business failures have been gradually rising for some months. while the volume of new enterprises has fallen rather sharply. Compared with a year ago failures are considerably more numerous, while both the volume of capitalization and the number of new enterprises established are lower.

This condition is a moderately unfavorable indication. New enterprises have not fallen so low nor have business failures become so numerous as in periods of depression; but neither is the volume of new enterprises so large or the number of failures so small as in boom times. In fact, neither of the indexes is far from the average of the period 1921-25.

But the situation indicates considerable uncertainty as to the future, as business prosperity is not so general and widespread as the favorable earnings statements of the leading corporations would suggest. Margins of profit are so narrow that the death rate in business is above the average and, as appears in the chart, is relatively high in comparison with the birth rate.

Foundry Equipment Makers Report Gains in Sales, Shipments and Unfilled Orders

Gains in sales, shipments and unfilled orders were reported for the month of December, 1926, by members of the Foundry Equipment Manufacturers' Association. Total sales for that month were $652,334, an increase of 43 per cent over the figure for November and a gain of 38 per cent as compared with December, 1925. Total shipments for December, 1926, were $542,640, which represented a gain of 25 per cent over the figure for the preceding month and an increase of 5 per cent as compared with December, 1925. Orders on hand Jan. 1, 1927, totaled $682,896, or 19 per cent more than the figure reported as of Dec. 1.

Tunnel to Use 20,000 Tons of Iron Segments

Contract for the tunnel under the East River at Fifty-third Street, New York, will probably be awarded in a few days to Patrick McGovern, Inc., 50 East Forty-second Street, New York. The low bid was submitted by this contractor and award has been approved by the Board of Transportation of New York. Included in the contract will be about 20,000 tons of cast iron segments for the tunnel walls.

Schedule of the next installments of the ***Business Analysis and Forecast,*** *by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows:* ***March 17****—Activity in Steel-Consuming Industries;* ***March 24****—Position of Iron and Steel Producers;* ***March 31****—General Business Outlook.*

MORE STEEL CASTINGS

January Bookings Largest in 10 Months—Production Also Heavy

WASHINGTON, March 1.—Bookings of commercial steel castings in January totaled 101,142 tons, according to reports received by the Department of Commerce from 122 concerns. This was the largest total since last March. It was 76 per cent of the monthly capacity of 132,500 tons, representing more than four-fifths of the commercial capacity of the country. Bookings totaled 85,747 tons in December, or 65 per cent of the capacity of the reporting producers.

Of the January bookings, 48,717 tons was for railroad specialties, being 81 per cent of this class of capacity, against 38,111 tons in December, or 63 per cent. Miscellaneous castings booked for January amounted to 52,425 tons, or 72 per cent of this capacity, against 47,636 tons, or 66 per cent, in December.

Production of commercial steel castings in January aggregated 84,050 tons, or 63 per cent of capacity, against 81,804 tons, or 62 per cent of capacity, in December. Except for November, with 86,285 tons, January showed the highest output since last July. Of the January production, 32,628 tons was for railroad specialties, being 54 per cent of this kind of capacity, and comparing with 28,699 tons, or 48 per cent, in December. Miscellaneous production in January amounted to 51,422 tons, or 71 per cent of capacity, against 53,105 tons, or 73 per cent, in December.

Increased Production of Pumps

According to data collected by the Department of Commerce at the biennial census of manufacturers, taken in 1926, the establishments engaged primarily in the manufacture of pumps and pumping equipment reported, for 1925, a total output valued at $120,148,157. This was an increase of 29.3 per cent, compared with $92,930,056 for 1923, the last preceding census year.

Increase in Canadian Pig Iron Output in January

TORONTO, ONT.—The production of pig iron in Canada in January amounted to 51,717 gross tons, a decline of 4 per cent from the 53,971 tons reported for December. The production by grades consisted of 21,900 tons of foundry iron, a slight increase over the 18,620 tons made in December; basic iron at 28,852 tons compared with 35,351 tons for December; malleable iron, 965 tons, against none produced in December.

The same five furnaces were blowing at the end of January as at the close of the previous month. These were located as follows: British Empire Steel Corporation, Sydney, N. S., 2; Steel Co. of Canada, Ltd., Hamilton, Ont., 2; Algoma Steel Corporation, Sault Ste. Marie, Ont., 1. There has, however, been some change in furnaces within the past two weeks. The Algoma corporation blew in its No. 3 stack and is blowing out No. 2 furnace. No. 3 furnace is now producing merchant iron but will go on basic when the rail mill starts up March 7. On March 1, No. 1 blast furnace will be blown in at the Soo and will run on foundry and malleable iron, so that six stacks will be in operation within the next two weeks.

A slight increase was recorded in the production of steel ingots and castings in January, with 58,551 gross tons, compared with 58,493 tons in December. Production consisted of 55,898 tons of steel ingots and 2653 tons of direct steel castings.

New Tool Steel Appears on the Market

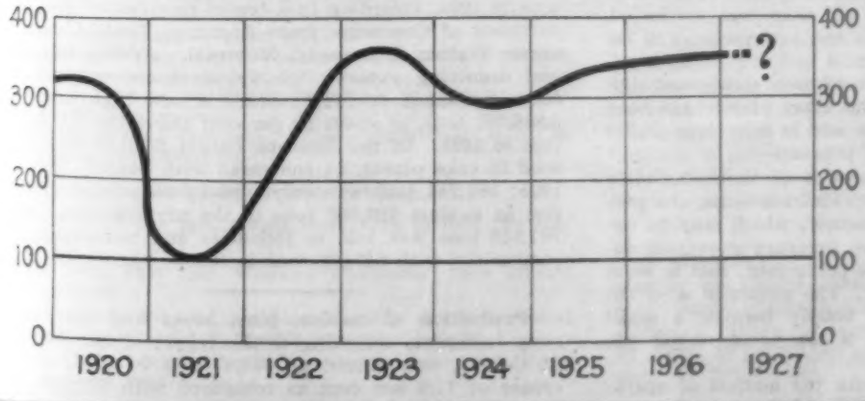
After several years of experimentation in the manufacture and of trial in use among its customers, the Crucible Steel Co. of America announces a new tool steel under the name HYCC. At a meeting of a sales conference of the central division of the company at Cleveland last week, A. T. Galbraith, vice-president and general manager of sales, made public the results of recent developments in the use of this steel by customers. The first experiments in producing this particular grade were made in 1902 at the Sanderson works of the company under the direction of Dr. John A. Mathews. A part of the slow progress in bringing this steel to its full development was due to the difficulty of securing suitable ferroalloys in the earlier days. The steel is primarily a die steel, although there are a few other uses for it. It is stated that its wearing properties, or life, are particularly long. No information is given out as to its composition.

Steel Furniture Shipments Continue High

Shipments of steel furniture in January are reported by the Department of Commerce at $2,697,857, on the basis of returns from 33 manufacturers. While this is lower than the December total of $2,934,331, and also lower than the figure of $2,859,393 for January, 1926, it is above the average month of 1926 and is higher than any month except December in 1925. New orders in January at $2,859,322 made the highest record since last April and, with three exceptions, the highest in more than two years. Unfilled orders at the end of January amounted to $1,713,098, the highest level since April 30.

Shipments of steel shelving were lower in January at $533,539. This compares with $621,773 in December, with $578,161 in January, 1926, and with an average of more than $611,000 monthly in 1926. Unfilled orders on Jan. 31 were $612,156.

Trend of Foundry Equipment Sales for Seven Years



THE chart shows the trend of sales reported by the Foundry Equipment Manufacturers Association, an American industrial group that does a normal business of about $5,000,000 a year. The average for 1921 is taken as 100.

Conference on Elimination of Unnecessary Fatigue

A summer school featuring discussions on the elimination of unnecessary fatigue in industry will be held under the auspices of the International Association for the Study and Improvement of Human Relations and Conditions in Industry at Hotel Bellevue, Baveno, Italian Lake Region, June 19-25.

Lectures to be given include: Work and Temperament; Work and Self Expression; Length of Working Day and Rest Periods; Elimination of Eye-Fatigue; Influence of Indirect Causes of Fatigue; Influence of Posture; and the Elimination of Ear-Fatigue. The lectures will be delivered in the morning and will be followed by round table discussion, plant visits or sightseeing. Lectures will be in English, French and German.

Mrs. L. M. Gilbreth, consulting engineer, Montclair, N. J., is chairman of the school, and Miss M. L. Fleddérus, secretary of the international association, with headquarters at 10 Goethestrasse, Zurich, Switzerland, is acting as secretary. Dr. A. Correggiari, organizateur d'oeuvres sociales, Milan, is acting as host.

Supplies Bessemer Converters from Turbo-Blowers

The Jones & Laughlin Steel Corporation, at its Aliquippa works, Woodlawn, Pa., has been operating its Bessemer converters for the past few months with turbo-blowers, a new application for this type of blower. With the rise of demand for open-hearth steel and the decline of that made in the Bessemer converter, not the same amount of attention has been paid to methods of improving Bessemer practice as there has been in other modes of steel making. In this application of the turbo-blower, therefore, the company is pioneering, but with much different results from those usually attending the initial and early experiments in a new field of engineering.

Use of the turbo-blower on a Bessemer converter in this instance has materially reduced the time required to blow a heat, a desirable development from both the operating and management standpoints, and there is also a decided saving of time in bringing the blower from idling to full speed. The units were built and installed by the General Electric Co.

The blowers were purchased to operate through a volume range up to 45,000 cu. ft. per min., against 35 lb. pressure, and it was further specified that the machines would supply 48,000 cu. ft. at 30 lb. pressure and 51,000 cu. ft. at 25 lb. pressure. The blowers have five stages, water-cooled, and the turbines are of eight stages and rated at 5700 hp. In tests made at the Lynn, Mass., plant of the General Electric Co., the machines delivered 35,000 cu. ft. at 50 lb. pressure, 39,000 cu. ft. at 46.4 lb., 43,500 cu. ft. at 44.4 lb. and 50,000 cu. ft. at 42 lb.

The two units were purchased with an idea of operating one on each of the two converters, but it was found after installation because of conservative rating of the units and the fact that the old displacement blowers were delivering less air than was estimated, one of the new blowers, with the assistance of a reciprocating blower operating at 8 to 10 r.p.m. in parallel, was sufficient to take care of both converters simultaneously. Consequently, the other blower has been placed in blast furnace service and is delivering 56,000 cu. ft. per min. at 18 to 20 lb. pressure.

One of the interesting features of the installation is the governing mechanism. The machines are provided with a combination governor, which may be operated as a volume or an air pressure governor, depending upon the service to be performed; that is, blast furnace or converter blowing. The governor is of the standard G-E type, and by simply turning a small hand-operated wheel 90 deg., it can be converted into a pressure governor.

A feature in connection with the method of operation is the brief time to bring the blower to full speed. Under normal conditions the blower is practically shut down when air is not required by the converter and it is allowed to run idle at 500 to 800 r.p.m. When the signal is given for air, the operator merely releases a lever and allows the machine to come to full speed automatically. Due to the fear that too much time would be required to fill the 1300 cu. ft. of air pipe line, it was felt that the unit should come to speed as quickly as possible, and for several weeks the average time required for this purpose was 6 to 8 sec. Experience has shown that it is unnecessary to bring the unit to its full speed of 4000 r.p.m. so rapidly, and the period of operation now is 15 to 25 sec.

Cincinnati Rail-River Terminal Handles First Steel Shipment

The Cincinnati river-rail terminal, the construction of which has just been completed by the Cincinnati River-Rail Terminal Co., was placed in operation this week. A bargeload of steel from the Jones & Laughlin Steel Corporation for delivery to its local warehouse was the first material to be unloaded. The terminal is equipped to transfer goods from river craft to railroad cars or motor trucks by means of cranes.

The transfer charge on pig iron has been set at 35c. a ton, while the switching expense from the terminal to destination in the Cincinnati metropolitan area ranges from 27c. to 37c. a ton. Producers and dealers look upon this rate as excessive in comparison with the all-rail rates from furnaces to local melters. George W. Breiel, managing director of the terminal, states that in all probability the charges for transferring pig iron will be materially decreased after actual costs of handling material are determined.

Meeting of Mechanical Engineers at Kansas City

Among the papers scheduled for the Kansas City meeting of the American Society of Mechanical Engineers, April 4-6, are the following: Training for Foremanship, by L. A. Hartley; Education Training for Industry, by P. F. Walker; Mechanical Pumping Methods and Equipment, by G. McConnell; Industrial Management, by James McQueeney; Railway Shop Administration, by William R. Harris; Personnel Administration in Steel Industry, by F. V. Larkin; Treatment of Feedwater for Industrial and Power-Plant Boilers, by S. T. Powell; Present Tendencies in Steam-Station Design and Generation, by V. E. Alden; Kansas City Industrial Development, by Lou Holland; Burning of Mid-West Fuels, by F. S. Collings; Industrial Furnaces, by V. J. Azbe; and Production and Distribution of Fuel, by C. M. Young.

Canadian Coke Production in 1926

WASHINGTON, March 1.—The output of coke in Canada in 1926 amounted to 1,909,588 tons, an increase of approximately 25 per cent over the 1,471,116 tons produced in 1925, and 28 per cent more than the 1,370,599 tons in 1924, according to a report received by the Department of Commerce from Assistant Trade Commissioner Walter J. Donnely, Montreal. Adding imports and deducting exports, the apparent consumption of coke in Canada in 1926 reached a new high level at 2,836,367 tons, or about 20 per cent above the 2,278,551 tons in 1925. Of the domestic output 248,113 tons was used in coke plants, as compared with 246,567 tons in 1925; 901,244 tons was employed by associated smelters, as against 703,056 tons in the previous year, and 767,940 tons was sold to foundries and households, in comparison with 542,936 tons in 1925.

Production of needles, pins, hooks and eyes, and snap fasteners, according to the report of the Bureau of Census, was valued at $18,173,574 in 1925, a decrease of 17.9 per cent as compared with $22,147,468 for 1923.

PIG IRON DUTY INCREASED

Tariff Heretofore 75c, Is Advanced to $1.125 per Gross Ton

WASHINGTON, March 1.—Becoming effective on the day of its promulgation, President Coolidge on Wednesday of last week issued a proclamation increasing the duty on pig iron 50 per cent (37.5c.) from 75c. to $1.125 per gross ton. The higher duty applies to all imports of pig iron. The proclamation was made under the authority granted the President by the flexible provision of the Fordney-McCumber tariff act. It was the outgrowth of applications filed by Eastern merchant blast furnace interests with the United States Tariff Commission, asking for an increase of 50 per cent in the duty on pig iron, the maximum allowed under the flexible provision.

The original application was filed on Dec. 7, 1922, less than two months after the Fordney-McCumber act went into effect. A second application was filed on Sept. 22, 1924. The investigation of the commission began on March 27, 1923. The commission report on the application, made public on March 15, 1926, made it clear that an increase in duty would be recommended and this was done by the commission in its recent report to the President.

The report, based on the inquiry, an abstract of which was published in THE IRON AGE of March 18, 1926, pages 780-781, showed among other things that, at the time of the investigation, pig iron was being made in British India at $7.70 per ton below the American cost, laid down at Boston. The proclamation of the President said that British India is the principal competing country. This is explained by former conditions, although Germany now is the principal source of American imports of pig iron.

Recently an anti-dumping decision was rendered against imports of pig iron from Germany, though these now have become comparatively small. The Presidential proclamation, together with the anti-dumping decision, means that imports from Germany will face not only the higher duty of $1.125 per ton, but also a dumping duty, provided it is shown the German iron is sold into the United States at less than the German domestic price.

Eastern merchant blast furnace interests had also succeeded in getting a countervailing order from the Treasury Department, fixing a countervailing duty on imports of pig iron from the Tata Iron & Steel Works in British India. This duty, however, was never fixed specifically and imports from India now are granted the same entry as other imports of pig iron, liquidation being suspended. It is understood that the countervailing duty never will be actually applied to imports from India, now that the Indian government proposes to increase its tariff duty on pig iron and steel, effective March 31, and to abandon its subsidies on the production of steel ingots. It was by reason of these subsidies that the countervailing order was issued, the claim being made that they constituted an indirect bounty on the production of pig iron.

REINFORCING STEEL

Inquiries on Upward Trend—Awards of the Week More Than 3500 Tons

With the approach of the spring building season, the demand for concrete reinforcing bars is slightly improved, the total of pending inquiries, as reported to THE IRON AGE, being about 5800 tons. The week's awards were more than 3500 tons. Of the pending work 1400 tons is for a power project on the Pacific Coast and 1000 tons for a warehouse in New York. Awards follow:

UNION CITY, N. J., 150 tons, public school, to Truscon Steel Co.

PROVIDENCE, R. I., 210 tons, Industrial Trust Co. building, to Truscon Steel Co.

PROVIDENCE, 100 tons, coal pocket for Providence Gas Co., to E. A. Tucker Co.

GREENSBURG, PA., 70 tons, Keystone Sanitary Supply Co. building, to Truscon Steel Co.

CLEVELAND, 650 tons, warehouse for the Kroger Grocery & Baking Co., to Bourne-Fuller Co.

CLEVELAND, 110 tons, Loew theater, to Bourne-Fuller Co.

CHICAGO, 122 tons of rail steel, Fabric Building, to Olney J. Dean & Co.

CHICAGO, 600 tons of rail steel, Cook County jail, to Inland Steel Co.

CHICAGO, 160 tons of rail steel, apartment building at 12009 Sherwin Avenue, to Olney J. Dean & Co.

CHICAGO, 125 tons of rail steel, apartment building at 5346 Cornell Avenue, to Inland Steel Co.

CHICAGO, 250 tons of rail steel, apartment building at 6929 Crandon Avenue, to Inland Steel Co.

CHICAGO, 100 tons, building in Gage Park, to Jones & Laughlin Steel Corporation.

SEATTLE, WASH., 900 tons, Rhodes department store, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 1000 tons, Williams Warehouse; Cass Gilbert, architect.

YOUNGSTOWN, 700 tons, warehouse for Erie Railroad, general contract awarded to Charles Shatrump & Sons.

GARY, IND., 300 tons, bridge for the Chicago, South Shore & South Bend Railroad.

CHICAGO, 125 tons, apartment building at 6321 Kenmore Avenue.

CHICAGO, 500 tons, Statler Hotel.

CHICAGO, 200 tons, St. Ann Hospital; H. J. Gaul, architect.

CHICAGO, 110 tons, apartment building at Ninety-fifth and Vanderpool Streets.

CHICAGO, 425 tons of rail steel, superstructure for Chatelaine Tower Apartments; general contractors, Ericsson & Magnussen. Reinforcing bars for the foundations of this building were furnished by Calumet Steel Co.

SAN FRANCISCO, 150 tons, warehouse for Pacific Coast Syrup Co., Sansome and Pacific Streets.

SAN FRANCISCO, 1400 tons for the Feather River Power Co., for Bucks' Creek project; bids in.

PHOENIXVILLE, PA., 120 tons, Black Rock bridge.

PHILADELPHIA, 225 tons, school at Forty-first and Brown Streets.

PHILADELPHIA, 200 tons, service station at Twenty-third and Wood Streets.

PHILADELPHIA, 260 tons, St. Luke's Hospital.

BYBERRY, PA., 120 tons, school.

CAMDEN, N. J., 150 tons, Delaware River bridge approach.

NORRISTOWN, PA., 115 tons, high school.

POUGHKEEPSIE, N. Y., 400 tons, mid-Hudson bridge.

Silicon Content Adds to Ferromanganese Duty

WASHINGTON, March 1.—In a Treasury decision last week addressed to the collector of customs at Baltimore, he was instructed to follow the practice of other ports of entry and classify ferromanganese under paragraph 302 of the Fordney-McCumber tariff act, making it dutiable at 1⅝c. per lb. of manganese content and 15 per cent ad valorem when containing more than 2 per cent of silicon.

Universal Pipe & Radiator Co., and subsidiaries, including the Central Foundry Co., Central Iron & Coal Co., Central Radiator Co., Molby Boiler Co. and Essex Foundry, report net earnings for the year ending Dec. 31, 1926, of $1,230,562 and total assets, as of the same date, of $21,907,682.

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman. *Vice-Pres.* Fred C. Stevens, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

Keeping Capital Employed

REPEATEDLY it has been argued of late that the easy position of the money market furnishes assurance that there will be no panic or industrial depression. Confined to its proper limits such reasoning is no doubt entirely sound, but there is a tendency to make the application too broad, to convert the conclusion from negative to positive. There may be assurance against depression or special inactivity, but the positive does not follow, that there is assurance of special activity.

The supply of capital is to be considered in connection with the demand. Easy money occurs when there is less demand than supply; but it is conceivable there have been times when lessened demand for money was due in part to less than full industrial and building activity.

In commodities an excess of supply over requirements is not considered good. There is either overproduction or underconsumption. Perhaps too much stress has been laid lately upon treating such unbalance as underconsumption rather than overproduction. In a given commodity there can obviously be overproduction. Economic laws cannot be invoked to make people wear more clothes or eat more meat, though the way may be opened for them to spend surplus funds on other things, if the other things are made sufficiently attractive.

It may be that we have not a sufficient supply of new ideas, new projects, new things to make or do which will interest the public and promise profitable engagement of capital.

We have heard a great deal of argument lately to the effect that we have grown so efficient that men need work only five days a week instead of five and a half or six days. It would be rather awkward to apply the same argument to capital—that the supply is now such that we should keep some of it idle. Our foreign investments in recent years may suggest, however, that something has been developing in that direction.

It would be a very bad way to employ capital to reduce the working time. Shortening the week may be an advantage to workmen, giving them leisure, but capital does not require leisure. We cannot keep on shortening the working time indefinitely, for at length we should get to a three-day week, and then everything might be disarranged by some factories doubling production by introducing two three-day shifts. The production of the commodities involved would then be impossible of absorption.

Evidently we need more ideas, more new products and forms of service that will both attract capital and supply employment for labor. The public will buy new things if they are good enough but it cannot be induced to buy more of the old things if it already has enough.

Disagreeing Economic Doctors

AMID the welter of economic statistics, quasi statistics, and pure conjecture numerically expressed, the man in the street, if at all interested, is apt to call statisticians what the psalmist in his haste called all men. One authority estimates the wealth of the United States at a certain figure, the Bureau of the Census estimates it half as much more, while guessers double and treble totals according to the degree of rosiness of their views.

Similarly as to the national income. Dr. W. R. Ingalls lately estimated such income for 1925 at about 73 billion dollars. The National Bureau of Economic Research more recently published 86.5 billions for 1925 and 89.7 billions for 1926.

Neither of these authorities merely indulges in conjecture, the estimates of each having real foundation. The discrepancy between them is large, but is probably not nearly so large as appears. Either would admit the possibility of an error of 10 per cent, plus or minus. If one happened to be 10 per cent plus and the other 10 per cent minus for 1925 they would be in good agreement.

Probably both these estimates are well within a 10 per cent leeway and the variation is largely in method, which each authority has explained. The lower estimate is on the simple basis of production of commodities plus service, while the higher adds thereto estimated rental of property owned and occupied, plus estimated interest on consump-

tion goods owned. As between these thoughts anybody may choose who will.

The question is of much importance, for it is to this figure that many vital economic considerations are necessarily referred, such as living wage estimates, proportion of taxation to income, proportion of annual saving.

Down to this point discussion is rational. The medley really begins when we give attention to estimates of casual persons or organizations, generally of reforming character. An engineering committee not so long ago estimated that our annual waste in industry was something like 30 billion dollars. Another body has estimated more recently that traffic jams cost us about four billion dollars a year. A Harvard professor says that a revision of our alphabet would save about one billion dollars a year, while advocates of compulsory adoption of the metric system urge that it would save a billion dollars a year in the cost of educating our children.

This week our eye fell on an estimate of the organizer of the National Crime Commission that directly and indirectly crime costs America 13 billion dollars a year, while commercialized vice, bootlegging, etc., cost another five billion dollars. This promoter estimates that it costs the country approximately 16 billion dollars a year to support a criminal class which numbers two millions.

The last suggests an entirely new thought in economics, and that is that our total of 45 million workers should be divided into positive and negative, the latter averaging about $8,000 a year in respect to its criminal section. This, if true, would indicate that crime is a more profitable occupation than production.

When we are given such figures it does not matter much whether the total national income was 73 or 86.5 billions. They call to mind the story of the enthusiastic automobilist who equipped his car with an improved carbureter guaranteed to save 20 per cent in gasoline consumption, a new manifold guaranteed to do likewise, and several other new wrinkles of similar guarantee, with the result that in operating his car he had to stop every hundred miles to draw off his surplus of gasoline.

Russian Progress in Steel Making

BAD as political and general economic conditions have been in Russia under the Soviet Government, pig iron and steel production is making rapid progress toward the pre-war basis. The figures will surprise many. In 1913 the pig iron output was at the rate of 345,500 gross tons and the steel production at the rate of 396,700 tons per month. Russia ranked fifth as a producing nation in those days. Post-war recovery was slow up to 1925. In 1924 62,000 tons of pig iron and 81,600 tons of steel per month were the production rates. These figures were practically doubled in 1925 and by the end of the third quarter of last year pig iron had mounted to over 208,000 tons and steel to over 275,000 tons per month. Thus the rehabilitation of Russian metal-working industry is proceeding at a pace which if maintained may bring the country within a year or more to its pre-war position as an iron and steel producer. If order can be maintained further progress may be expected, for Russia has the raw materials and a plentiful supply of labor adapted to iron and steel manufacture. But for the building up of an iron and steel trade with other countries the outlook is much less promising.

The Illusion of Backlogs

BACKLOGS present a lure, but the steel producing trade at large realizes that under buying conditions of the past few years backlogs are illusory. An experience of two years ago is well remembered. With an apparent accumulation of backlog tonnage, various prices were advanced, particularly in bars, shapes, plates, wire and sheets; but the advances were soon lost. Meanwhile there have been two spells of price advances in one of these lines, with the same outcome.

Yet in other days it was the regular thing for backlogs to accumulate and for prices then to advance in apparently healthy manner, and for long periods. Why the difference? It lies in some backlogs being natural, others being artificial. When actual consuming requirements outrun productive capacity, or buyers think this is likely to happen, the backlog is a natural one. Such a condition was often indicated by premiums ruling for prompt shipment, particularly in 1902, 1906, 1912, 1916 and 1922.

Backlogs produced by artificial conditions are an illusion because the artificial conditions do not continue. Of all artificial conditions under which backlogs may accumulate, price cutting by producers is easily the worst; yet that has been seen more than once in the past two years in one finished steel product which has become notorious for its price fluctuations. The course of affairs in such a case starts by the impression going around that prices are soon going to advance. Each producer feels that he should "go along" in the advance, but he feels he should fortify himself for the process and accordingly sets in to accumulate a backlog. Often that is done by cutting prices, and concessions are made with the more freedom because it is thought that soon the occasion for making concessions will disappear entirely.

Of course, it should be obvious that whatever the number of tons sold the same number are bought. If the producer becomes particularly well sold up the consumer becomes equally well covered. The occasion for further selling is removed, but so is the occasion for further buying.

When there has been price cutting to fortify the seller to ask an advance over the level from which the cutting was done, the position is assumed of asking the buyer to pay a double advance. The backlog makes the undertaking seem easy, but the difficulty is really doubled. The backlog is an illusion.

In the more distant days, chiefly the days of wrought iron, before the contract system came into such general vogue, the markets for rolled products were steadier. They fluctuated, but chiefly in accordance with actual consumption. If a mill became well sold up it merely refrained from selling and when it needed orders again there was a market ready for it to enter. The trend in steel

buying and selling in recent years has been back to those first principles. In general the trade has found these principles sound, and the exceptions testing the rule are the few experiences observed of fictitious backlogs being produced by artificial conditions.

Refining Workmen's Compensation

CREATED to study the workmen's compensation law of the State, a special Massachusetts commission has filed with the legislature a voluminous report which seems likely to affect the Massachusetts law and perhaps to influence legislation in other States. Among many recommendations is that the law recognize that a thumb is more valuable than a finger, a forefinger than a little finger, a great toe than a little toe, and a right or major hand or arm than a left or minor hand or arm.

The report, in an amending bill, establishes indemnity in all cases on the basis of two-thirds the average weekly wage of the injured person. The variables lie in the number of weeks the indemnity shall be paid, and the maximum beyond which such payments shall not go, as follows:

> Loss of right or major hand or arm, or permanent incapacity of the member for practical use, as in work, is fixed at 100 weeks of indemnity, but in total not more than $1,000. Loss of left or minor hand calls for 75 weeks of payment, and $750 maximum; loss of both hands or arms, 175 weeks and $1,750; either foot or leg, 50 weeks and $500 maximum; and both feet or legs, 100 weeks and $1,000 maximum.
>
> As to fingers and toes, loss of either thumb brings 40 weeks payment not to exceed $400; one phalange of either thumb, 25 weeks and $250 limit; either forefinger, 25 weeks and $250; one phalange of either forefinger, 15 weeks and $250; great toe, 25 weeks and $250 maximum; one phalange of great toe, 15 weeks and $150; fingers, excluding forefingers and thumbs, and toes, excluding great toes, 12 weeks and $120 limit; and two or more such fingers or toes, 25 weeks and a maximum of $250.

In order to "procure a more liberal and practical method of measuring eyesight, the commission recommends that the employee who through industrial accident, suffers a reduction of three-tenths of practical vision in either eye, with glasses, as in working, shall receive the two-thirds wage for a period of 75 weeks, not to exceed $750. Similar loss to both eyes would give him compensation for 75 weeks, up to $1,500.

In recognizing facial or head disfigurement as a handicap to a worker, the recommendation is that the Industrial Accident Board be given discretion to award compensation not to exceed $2,000 in these cases. As to deafness, the report points out that this has not been given sufficient attention in compensation laws, and suggests that loss of hearing in one ear be compensated by 35 weeks of two-thirds wage, to a limit of $350, while deafness in two ears, caused by accident, shall entitle the sufferer to 70 weeks' compensation, not to exceed $700.

Compensating for the hazards of employment has certainly become a strongly entrenched principle in industrial economy when a classification of the pecuniary equivalents of accidents is attempted, as outlined in the Massachusetts proposal. Disfiguring accidents and deafness resulting from employment are serious handicaps in seeking opportunities to earn a living. It may be, as proposed, that industrial disease should be regarded in the category of accidents, and that the rehabilitation of the injured should receive compensation on a liberal scale. What industry wishes is not so much the equitable settlement of the questions as wide and early agreement, or approaches to an agreement, on these matters among many States. So long as we have interstate business, it is costly experimenting for the manufacturers in those few States which are wont to serve as the social laboratories of the country.

Recruiting College Men for Industry

TO secure the services of young college men as raw material in the manufacturing plants of the State, the Associated Industries of Massachusetts has undertaken a unique work as "recruiting officer." The authorities of New England colleges, it seems, have had it impressed upon them that industrial organizations outside of the territory, chiefly large employers of labor, have become aggressively active in this field. As a result, an increasing percentage of students pass from college to employment in other parts of the country.

Consequently the Associated Industries proposes to bring counter-influence to bear, with the idea of keeping a proper share of this valuable material at home. Active cooperation is promised from the Eastern College Personnel Officers' Association, made up of the placement authorities of these institutions. The Associated Industries seeks a like cooperation from its 1600 member firms, which include practically all the large industries and most of the enterprising small industries of the State, and which employ some 700,000 persons. It is proposed to uncover opportunities for college men in member plants, and a committee of the College Personnel Officers' Association undertakes to bring such opportunities to the attention of their students. In a communication to its members the Associated Industries sets forth its case as follows:

> Your active cooperation is needed in saving for New England the cream of her college graduates each year. In your firm, with its average annual turnover of 20 to 60 per cent of your working force, opportunities of an executive character are continually presenting themselves. These young college graduates and juniors selected by us will go into your organization prepared to serve their apprenticeship on the job in overalls. Surely there is room for one such apprentice each year to every 100 employees. If an opportunity comes to use his services in an executive capacity and he is the right man, then we have saved for New England the skill and ability he represents. If no such opportunity appears and he eventually goes on to some other organization, you are always certain that in the meantime he will have more than earned his salt in doing the work assigned to him.

Each member is urged to study his situation and report his requirements to the association.

Employment of undergraduate college students during their long summer vacations has become a popular practice in industry. This is one of the main reasons why each year greater numbers of this type of young men are seeking practical work in factories which would fit in with their ideas of what they would undertake after graduation. Certain of them in their summer employment show the sort of ability employers are seeking—that something which indicates that they will not stop on a lower rung of the ladder. The concern of managements, in looking into the future, is not so much the average run of workers as it is the material from which the various classes of executives may be trained. The ambitious, energetic young man with the background of a college education may well turn out to be an asset of great value.

LOW though inventories of steel buyers are admitted to be, the indications of annual financial statements are divergent. Close-range buying was no more marked at the end of 1925 than it was twelve months later, yet of eight steel consuming companies five showed expanded inventories and three the reverse. The five increases made a total of 42 millions of dollars, representing an inventory expansion of 26 per cent. The three decreases amounted to 12½ millions of dollars—a contraction of 23 per cent. That generalization cannot be based on this segment of the steel-using industries is clear when it is stated that one automobile company that was included showed an increase of over 39 million dollars, due in part to its notable growth. Discarding this exceptional case makes for the seven a net decrease in inventories of nearly 10 millions, or 10 per cent, though four had larger and only three had smaller inventories.

CORRESPONDENCE

Says It Did Not Sell Drilling Machines as Bickfords

To the Editor: With reference to an article on page 581 (Feb. 24) of your paper, we would appreciate your publishing the following statement:

Morey & Co., Inc., never offered as Bickford machines the German radial drills we sold.

S. M. MOREY,
President Morey & Co., Inc.

New York, Feb. 28.

Large Gain in February Iron Output

Estimates, Collected by Wire, Show Daily Rate 4811 Tons or 4.8 Per Cent Over January—Net Gain of 9 Furnaces

ACCORDING to data gathered by wire on March 1 from companies which made estimates of the pig iron production for the last day or two of February, the output last month made a sharp gain over that for January. The daily rate was 104,934 tons as compared with 100,123 tons per day for January. This is an increase of 4811 tons per day or 4.8 per cent. The estimated production for February was 2,938,164 gross tons for the 28 days, as compared with 3,103,820 tons for the 31 days of January.

Net Gain of Nine Furnaces

There were 11 furnaces blown in and only two shut down, a net gain of 9 for February. In January the net gain was 5 while in December there was a net loss of 10 furnaces. Of the 11 furnaces blown in 7 were Steel Corporation, 3 were independent steel company stacks and one was a merchant furnace. One Steel Corporation furnace and one independent steel company stack blew out. No merchant furnaces were shut down.

On March 1 there were 217 furnaces active out of 365 as compared with 208 on Feb. 1. The February production of 104,934 tons per day was 526 tons per day in excess of the 104,408 tons per day in February, last year.

Furnaces Blown In and Out

Among the furnaces blown in during February were one Edgar Thomson furnace of the Carnegie Steel Co. in the Pittsburgh district; one New Castle furnace of the Carnegie Steel Co. in the Shenango Valley; one furnace at the Cambria plant of the Bethlehem Steel Corporation in western Pennsylvania; one Ohio furnace of the Carnegie Steel Co. in the Mahoning Valley; two River furnaces of the Corrigan-McKinney Steel Co. in northern Ohio; two South Chicago furnaces of the Illinois Steel Co. and two Gary furnaces in the Chicago district, and one Mayville furnace in Wisconsin.

Among the furnaces blown out or banked during February were one Mingo furnace of the Carnegie Steel Co. in the Wheeling district, and one furnace of the Youngstown Sheet & Tube Co. in the Mahoning Valley.

Production by Districts

The estimated February production by districts is given in the table. The actual output for February will be published in THE IRON AGE, March 10.

Pig Iron Production by Districts, Gross Tons

	Feb. (28 days)	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)
New York and Mass.	199,085	212,856	210,243	218,657
Lehigh Valley	82,232	89,381	88,182	97,722
Schuylkill Valley...	74,981	79,010	65,283	64,716
Lower Susq. and Lebanon Valleys.	42,252	43,313	43,527	47,413
Pittsburgh district..	604,362	654,225	645,592	682,246
Shenango Valley...	99,748	105,748	96,733	93,466
Western Penna.....	102,330	97,315	105,996	113,005
Maryland, Virginia and Kentucky ...	90,964	89,990	88,488	87,659
Wheeling district...	118,827	120,873	128,077	111,166
Mahoning Valley...	264,185	287,686	281,275	316,586
Central and Northern Ohio	300,360	302,320	321,684	347,547
Southern Ohio.....	42,050	47,160	43,892	50,757
Illinois and Indiana	532,320	553,013	557,044	568,312
Mich., Minn., Mo., Wis., Colo. and Utah	140,742	152,266	151,468	150,931
Alabama	236,165	246,536	252,923	274,604
Tennessee	6,000	6,607	6,615	6,270
Total	2,938,164	3,103,820	3,091,040	3,236,707

Iron and Steel Markets

Further Gains, More Forward Buying

Nearly 5 Per Cent Pig Iron Increase in February—Steel Shipments More Than Bookings—Exports Largest in Three Years; Imports Fall Off

AS March comes in there is further betterment in the finished steel market. The chief contribution of the past week is in orders from a number of consuming lines for more extended deliveries than have been the rule in recent months.

In steel bars, plates, structural material and sheets there has been some buying for the second quarter, and other developments have confirmed the week-to-week indications in February of improvement in all respects apart from prices.

The steel trade has made no definite response to the disagreement of soft coal miners and operators at Miami last week. Expectation of a stoppage at union mines on April 1 is general, but with little fear of any resulting curtailment of steel output, in view of coal stocks that will reach into June and the large production of non-union mines.

Thus far reports from open-shop mines and coke plants indicate that the men are satisfied and will not go out, this situation being quite different from that of 1922.

Returns of pig iron production in February confirm reports in the month of steady gain in steel works operations. Ten steel company blast furnaces blew in and but two went out. Merchant furnaces had a gain of one. On March 1 active furnaces numbered 217 against 208 on Feb. 1, a net gain of 9.

In the 28 days of February, production was 2,938,164 tons, or 104,934 tons per day, against 3,103,820 tons in January, or 100,123 tons a day—a gain of 4.8 per cent in daily rate. In February, 1926, the daily rate was 104,408 tons, or 526 tons less than last month's.

Estimates of steel ingot production in February give it the highest daily rate since October, these ranging from 83 to 85 per cent, as against 81.5 per cent in January, 74 per cent in December and 80 per cent in November.

Shipments of the larger producers last month were more than new bookings, so that the industry as a whole made an inroad upon unfilled orders. Production, in turn, was slightly in excess of shipments, indicating some stocking of semi-finished steel.

Pittsburgh reports consumer interest in scrap for the first time in several weeks, and some strengthening in heavy melting steel—a situation that will be watched in the coming month.

With 25,000 tons for a New York Central Railroad office building in New York, the week's total of structural steel awards was about 70,000 tons. A New York church will take 7300 tons, a New York loft building 3500 tons, a Louisville & Nashville Railroad bridge 4000 tons, plant extensions for a sheet manufacturer at Ashland, Ky., 2700 tons, a county jail in Chicago 3400 tons, a club building in Los Angeles 2300 tons, and a Chicago mercantile building 3500 tons.

Tunnel work for another East River crossing for the New York subways will take some 20,000 tons of cast-iron segments shortly to be bought.

Freight cars bought by railroads and a coal company totaled 2100 within the week. Several large orders for steel underframes and superstructures for cars have also been placed. The Norfolk & Western is inquiring for 1000 steel car bodies.

Steel pipe prices are holding, but the seamless product is believed to have escaped sharp competition only because makers are slow to seek to broaden their markets.

In the pig iron market low prices, rather than the approaching coal strike, account for current activity, which is still confined largely to the Cleveland district and the Eastern seaboard. Sales by Cleveland producers, at 60,000 tons, brought the total for February up to 190,000 tons. With substantial backlogs for second quarter, Lake furnaces in Ohio have advanced prices 50c. a ton. In Michigan the market shows more life under increased activity in the automobile industry. In New England and in the New York metropolitan district the buying movement has passed its crest. Eastern Pennsylvania foundry iron has declined to $20.50, base.

By Presidential proclamation the duty on pig iron becomes $1.12½ per ton on March 25, an advance of 37½c., which is small relief for hard-pressed Eastern blast furnaces.

Higher ocean freight rates from Atlantic ports to the Pacific Coast, looked for late in April, may have a marked bearing on Eastern business with the Far West, seeing that the proposed advance is from 25c. to 40c. per 100 lb.

Exports of iron and steel in January, at 215,235 gross tons, made the highest total (except for last November) since January, 1924. The principal increases over a year ago were in tin plate (from 21,143 tons to 41,874 tons), steel rails (from 9198 tons to 23,387 tons) and wrought tubes (from 32,959 tons to 42,300 tons).

Imports of iron and steel in January, at 63,452 gross tons, were the smallest since November, 1924. Pig iron fell to 9326 tons—less than one-fifth the 48,423 tons of January, 1926.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Mar. 1, 1927	Feb. 21, 1927	Feb. 1, 1927	Mar. 2, 1926
No. 2, fdy., Philadelphia	$21.76	$21.76	$21.76	$23.26
No. 2, Valley furnace	18.50	18.50	18.50	20.50
No. 2, Southern, Cin'ti	21.69	21.69	21.69	25.69
No. 2, Birmingham	18.00	18.00	18.00	22.00
No. 2 foundry, Chicago*	20.00	20.00	20.50	23.00
Basic, del'd eastern Pa.	21.00	21.00	21.50	23.00
Basic, Valley furnace	18.00	18.00	18.00	20.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	22.76
Malleable, Chicago*	20.00	20.00	20.50	23.00
Malleable, Valley	18.50	18.50	18.50	20.50
Gray forge, Pittsburgh	19.76	19.76	19.76	21.76
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	100.00	100.00	100.00	115.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	35.00
Bess. billets, Pittsburgh	**34.00**	33.00	33.00	35.00
O.-h. billets, Pittsburgh	**34.00**	33.00	33.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	36.00
Forging billets, P'gh	40.00	40.00	40.00	40.00
O.-h. billets, Phila	38.30	38.30	40.30	40.30
Wire rods, Pittsburgh	43.00	43.00	43.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.22	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.90	1.90	1.90	2.00
Steel bars, Chicago	2.00	2.00	2.10	2.10
Steel bars, New York	2.24	2.24	2.24	2.34
Tank plates, Pittsburgh	1.85	1.85	1.90	1.85
Tank plates, Chicago	2.00	2.00	2.10	2.10
Tank plates, New York	2.19	2.19	2.24	2.14
Beams, Pittsburgh	1.90	1.90	1.90	1.90
Beams, Chicago	2.00	2.00	2.10	2.10
Beams, New York	2.19	2.19	2.24	2.24
Steel hoops, Pittsburgh	**2.30**	2.20	2.25	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Mar. 1, 1927	Feb. 21, 1927	Feb. 1, 1927	Mar. 2, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.75	2.75	2.85	3.10
Sheets, black, No. 24, Chicago dist. mill	**2.95**	2.90	3.00	3.30
Sheets, galv., No. 24, P'gh	3.65	3.65	3.75	4.05
Sheets, galv., No. 24, Chicago dist. mill	3.85	3.85	3.85	4.25
Sheets, blue, 9 & 10, P'gh	2.20	2.20	2.20	2.50
Sheets, blue, 9 & 10, Chicago dist. mill	2.30	2.30	2.35	2.60
Wire nails, Pittsburgh	2.55	2.55	2.60	2.65
Wire nails, Chicago dist. mill	2.60	2.60	2.65	2.70
Plain wire, Pittsburgh	2.40	2.40	2.45	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.50	2.55
Barbed wire, galv., P'gh	3.25	3.25	3.30	3.35
Barbed wire, galv., Chicago dist. mill	3.30	3.30	3.35	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$15.00	$15.00	$15.50	$17.00
Carwheels, Philadelphia	16.00	16.00	16.00	17.50
Heavy melting steel, P'gh	16.00	16.00	16.50	17.50
Heavy melting steel, Phila.	14.50	14.50	15.00	15.50
Heavy melting steel, Ch'go	12.75	12.75	13.25	13.75
No. 1 cast, Pittsburgh	15.75	15.75	15.75	17.00
No. 1 cast, Philadelphia	17.00	17.00	17.00	17.50
No. 1 cast, Ch'go (net ton)	16.50	16.50	16.50	17.00
No. 1 RR. wrot., Phila.	17.00	17.00	17.00	17.50
No. 1 RR. wrot., Ch'go (net)	12.00	12.00	12.75	12.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.50	$3.50	$3.25	$3.00
Foundry coke, prompt	4.50	4.50	4.25	4.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**13.25**	13.12½	13.25	14.37½
Electrolytic copper, refinery	**13.12½**	12.75	12.87½	13.87½
Zinc, St. Louis	**6.82½**	6.85	6.57½	7.35
Zinc, New York	**7.17½**	7.20	6.92½	7.70
Lead, St. Louis	**7.32½**	7.30	7.20	8.60
Lead, New York	7.40	7.40	7.40	8.90
Tin (Straits), New York	**69.62½**	70.25	66.50	64.00
Antimony (Asiatic), N. Y.	*13.50*	14.25	14.50	30.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

February Best Month for Steel Bookings Since October—Large Purchase of Coking Coal

PITTSBURGH, March 1.—In a general way February proved to be the best month in point of bookings and specifications that the Pittsburgh district steel manufacturers had since last October, and as compared with an ingot production of 75 per cent of capacity at the beginning of the month, the rate at the end of the month was 82 per cent.

It was a month of recovery in all directions except in prices, which, barring those on billets and slabs and hot-rolled flats and plates, are not notably stronger than they have been in recent weeks. The advance in hot-rolled flats—hoops, bands and strips—seems to have come after manufacturers had given buyers liberal coverage at the lower prices, and it is not disputed that it will be some time before the higher figures can become effective. Incidentally, strips wider than 12 in. do not seem to have shared in the upswing and carry prices based on sheets or plates, according to the gage. The common finishes of sheets are still seeking lower levels, although competition from wide strips, which was credited with some of the early January unsettlement of sheet prices does not yet appear to have assumed important proportions.

While in point of total business the past month has been a good one, it is one of the striking features of the situation that all products have not shared alike in the betterment, nor do all companies make a cheerful report. Large producers with a diversified line seem to have fared much better than the smaller companies making a few products. The irregularity continues even in that respect, since strip makers as a rule are in the latter classification and all of them have good order books, while producers of bars with order books large enough to furnish a two weeks' schedule are the exception rather than the rule.

There is consumer interest in scrap for the first time in several weeks and with it some strengthening of the steel works grades. Steel works engagement has expanded and that may be behind the demand, while the failure of the mine owners and the miners' union representatives to reach an agreement at the Miami, Fla., conference strengthens the belief that there will be a strike at the union mines on April 1 and may be causing some concern about supplies. With the coal mine issue only a month off, no one seems to have any very decided idea of what is likely to happen. Reports from the open shop mines and coke plants suggest that the men are satisfied and do not want to go out, but there were similar reports in 1922, when the suspension of operations was almost as extensive in the non-union as in the union districts. If the assertions of the operators and the union leaders are to be accepted at face value, a real struggle is ahead.

The coal market has been enlivened but not materially strengthened by a coking coal contract closed in the past week for 420,000 tons, 60,000 tons to move this month and the remainder to go at 30,000 tons a month for the year beginning April 1. The price was between $1.94 and $2 per net ton at mines.

The pig iron market is taking on a stronger tone after some recent uncertainty, not because of large purchases but because of doubt as to the fuel situation after April 1.

Pig Iron.—Foundry pig iron dipped 50c. per ton on some sales by a Youngstown steel maker anxious to move a stock to make way for plant improvements, but this producer late last week announced an advance to $18.50, furnace, for No. 2 grade, the price at which other Valley furnaces have consistently held. None of this grade now appears available from Valley furnaces at less than that price, although a lower equivalent price is understood to have been named on the 4500 inquired for by a Greensburg, Pa., melter. The recent price of $18, Valley furnace, on basic iron has been sustained on sales of between 5000 and 10,000 tons. Steel makers with any surplus of this grade are indisposed to sell it until they know more about the fuel situation after April 1. Only small lots of Bessemer iron are changing hands, but on all business the price has been $19, Valley furnace. Melters are taking out iron on contracts with greater freedom than recently, and stocks on furnace yards are decreasing. W. P. Snyder & Co. make the average price of Bessemer iron from Valley furnaces in February $19 and of basic $18, against $19.28 and $18.25 respectively in January.

We quote f.o.b. Valley furnace, the freight for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus, copper free	28.00

Steel and Iron Bars.—In this immediate territory steel bars are still selling at 1.90c., base Pittsburgh, for carload or ordinary-tonnage lots. Demand is good, but largely for early shipment, and few mills can schedule as much as two weeks ahead. Iron bars are steady.

Structural Steel.—In the area they control through favorable freight rates Pittsburgh mills are not going below 1.90c. for the ordinary day-to-day tonnages, but prices outside the district are governed by local conditions. There is a fairly good volume of structural steel up for bids, and with the shops in this area rather "hungry" for orders, prices are highly competitive and this makes it difficult for the mills to be strong on prices.

Plates.—Mills in this district have enough business to be able to take a firmer stand on prices, and 1.90c., base Pittsburgh, not only is quoted on carloads, but on lots of as much as 300 and 400 tons. The large-lot price is 1.85c., and while possibly 1.80c. might be done on railroad car material, this would call for copper-bearing steel, for which there is an extra of $3 per ton. Narrow plates are having competition from wide strips.

Cold-Finished Steel Bars and Shafting.—Steady, if gradual, expansion in the activity of the automotive industry finds reflection in the specifications for cold-finished steel bars, and business is helped by greater demands than recently from other consuming industries. There is still some irregularity in prices, but most makers want 2.40c., base Pittsburgh, for the ordinary tonnages.

Cold-Rolled Strips.—The market can still be quoted at 2.80c. to 3c., base, Pittsburgh or Cleveland, according to the size of the tonnage offered. There is some evidence of lessening of competition, because makers generally have fair-sized order books, and the complaint is common that these prices are unprofitable.

Bolts, Nuts and Rivets.—New price lists on bolts and nuts will be issued in the next week or 10 days; one card and a common discount is embraced, and it is understood that broken-case lots call for an extra over full cases. Bolt and nut business has improved in the past month. Good business is reported in rivets, but with continued keen competition among makers. Prices are easy.

Ferroalloys.—New business continues very light, but shipments against contracts are steady and inclined to expand in keeping with steel works operations. Prices show no change. Spot offerings of spiegeleisen are very limited, as consumers who have bought for the first half of this year are specifying fully and leaving little for the occasional buyer. So far as is known, no foreign spiegeleisen is available.

Semi-Finished Steel.—Sales are noted of some good-sized lots of large billets and slabs at $34, f.o.b. Pittsburgh, and that price now appears to be as low as any of the makers in this district will go on new business. As there has been no change in sheet bar prices, the market is quotable at the same price for large billets and slabs and for sheet bars. The business of the week includes a five-figure tonnage of slabs for shipment from a Pittsburgh district mill to a Youngstown district consumer. Forging quality billets hold at $40, base, f.o.b. Pittsburgh. Wire rods are still priced at $43, base Pittsburgh or Cleveland, and the usual open market quotation on skelp is 1.90c. per lb.

Wire Products.—February business shows a substantial increase over the month before with all makers in this district, and the bookings of one company were almost up to its average monthly producing capacity, making it in this case the best month in fully a year. Within the area controlled through freight rates by Pittsburgh district mills, the market may now be described as steady at $2.55, base per keg, Pittsburgh, for nails and $2.40, base per 100 lb. for bright wire.

Rails and Track Supplies.—Standard-section rails continue to move steadily on contracts, but, probably awaiting track-laying weather, the railroads are not yet taking out the track accessories with much freedom. Fair demand is noted for light-section rails. Prices are given on page 669.

Tubular Goods.—No new line pipe business of importance has been placed in the past week, but makers generally are well supplied with orders for that class of goods in sizes larger than 10 in., and because these sizes do not go through the mills with much rapidity, there is a tendency to extend delivery promises on the smaller sizes of lapwelded pipe. Oil and gas well pipe is coming into stronger demand, and standard pipe is being called for in larger quantities from the sections of the country already favored with good building weather. Pipe prices are holding steadily, but there are

THE IRON AGE Composite Prices

Finished Steel

March 1, 1927, 2.367c. Per Lb.

One week ago	2.367c.
One month ago	2.396c.
One year ago	2.431c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.367c.,	Feb. 21
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

March 1, 1927, $18.96 Per Gross Ton

One week ago	$18.96
One month ago	19.21
One year ago	21.71
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.96,	Feb. 15
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
Del'd Cleveland	2.09c.
F.o.b. Cleveland	1.90c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c.

Rail Steel

F.o.b. mill	1.70c. to 1.80c.
F.o.b. Chicago	1.90c. to 2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Reined iron, f.o.b. P'gh mills	2.90c. to 3.00c.
Common iron, del'd Philadelphia	2.12c. to 2.22c.
Common iron, del'd New York	2.14c. to 2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.12c. to 2.22c
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c. to 2.19c.
Del'd Philadelphia	2.07c. to 2.22c.
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.30c.
All gages, 6 in to 12 in., P'gh	*2.10c.
All gages, narrower than 6 in., Chicago,	2.50c. to 2.60c.
All gages, 6 in. and wider, Chicago,	2.30c. to 2.50c.

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.30c. to 2.40c.
Bars, f.o.b. Chicago	2.40c.
Bars, Cleveland	2.45c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	2.80c. to 3.00c.
Strips, f.o.b. Cleveland mills	2.85c. to 3.00c.
Strips, delivered Chicago	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galv'd nails, 1-in. and longer	4.55
Galv'd nails, shorter than 1-in	4.80
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.25
Barbed wire, painted	3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	63.00
F.o.b. Birmingham	63.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10 to 2.25c.
Nos. 9 and 10, f.o.b. Ohio mill	2.10c. to 2.30c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.30c. to 2.35c.
Nos. 9 and 10, del'd Philadelphia	2.47c. to 2.62c.
Nos. 9 and 10, f.o.b. Birmingham	2.35c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.75c. to 2.85c.
No. 24, f.o.b. Ohio mill	2.80c. to 2.90c.
No. 24, f.o.b. Ch'go dist. mill	2.95c. to 3.05c.
No. 24, del'd Philadelphia	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.80c. to 3.90c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.60c. to 3.75c.
No. 24, f.o.b. Ohio mill	3.70c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill	3.85c. to 3.95c.
No. 24, del'd Philadelphia	3.92c. to 4.02c.
No. 24, f.o.b. Birmingham	3.90c. to 4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.10c. to 3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.15c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.00 to $3.15
2300	(3½% Nickel)	4.30 to 4.40
2500	(5% Nickel)	5.50
3100	(Nickel Chromium)	3.30 to 3.40
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.30 to 3.40
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.20 to 4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.20 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets, f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $3.00
Spikes, ½ in. and smaller	2.90 to 3.25
Spikes, boat and barge	3.25
Track bolts, all sizes	3.90 to 4.50
Tie plates, steel	2.35
Angle bars	2.75

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel: Inches	Black	Galv	Iron: Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	42½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	42½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	⅛ to ⅜	+10	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	13
¾	58	47½	1 to 1½	30	14
1 to 1¼	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 8	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in	37	1½ in	+13
2½ to 2¾ in	37	1¾ to 1⅞ in	+ 5
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3½ in	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.20%, base	55
Carbon, 0.20% to 0.40%, base	50

Plus differentials for lengths over 13 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

fears that if makers of seamless pipe seek to broaden their markets there would ensue a competitive market. Boiler tubes are easy. Discounts are given on page 669.

Sheets.—Demand for sheets is still increasing, with some really good-sized orders coming out for automobile body sheets and for railroad passenger cars and farm implements, but prices are unresponsive to the larger bookings, which in turn mean heavier mill operations. Automobile body sheets are holding well, and mills in this district have not found it necessary to go below recent prices on blue annealed sheets, but the other common finishes are weaker, with 2.75c., base Pittsburgh, coming out fairly frequently on black and as low as 3.60c., base, being heard of on galvanized.

Tin Plate.—Makers having contract customers are still operating at substantially full physical capacity, and it is said that in this performance it is not necessary to do much advancing of orders. There is some of this, however, because container manufacturers from time to time fall under expected quotas in their specifications.

Hot-Rolled Flats.—All makers are now quoting 2.30c., base Pittsburgh, for widths under 6 in. and 2.10c., base, for stock 6-in. to 12-in. On material wider than 12-in. the price is based either on sheet or plate prices, depending on the gage. On strips, No. 13 gage and lighter, blue annealed sheet prices figure in the quotation, while on heavier gages the plate base is the determining factor. With strict observance of these prices they become a quotable market, but as consumers generally are well covered against their immediate requirements at lower prices, the new levels are untested.

Coke and Coal.—Spot furnace coke is slightly easier this week. There is almost no blast furnace demand, and non-metallurgical consumers have balked at prices higher than $3.50 per net ton at ovens. On recent business, that is all that could be obtained, as there are rather free offerings of medium-sulphur 48-hr. coke at $3. There is still stocking of foundry coke against a possible strike of coal miners on April 1, and prices of that grade for spot delivery are firm at recent levels. Prices of $4 to $4.25 per net ton are mentioned on second quarter contracts for furnace coke, with a cut or advance if wages change during the life of the contract from the present rate calling for $6 per day for day labor at the mines. Coal prices remain easy, as supplies are still more than ample for the demand. The Central Alloy Steel Corporation will start up its new by-product coke plant at Massillon, Ohio, on or about April 1, and has covered its coal requirements, amounting to 420,000 tons, shipments to run to April 1 next year. On the Pittsburgh rate of freight the prices figure $2 per net ton at mines, which means $1.94 at Connellsville mines, from which shipments will be made.

Old Material.—The past week has produced some evidence of consumer interest, and on the steel works grades the market is slightly stronger than it has been. One steel company paid $16 for a fair-sized tonnage of heavy melting steel, and another, $16.50. This is the first mill business in several weeks, and dealers are beginning to take a more bullish view of the situation, banking on the threatened strike of the union coal miners on April 1 to bring on heavier steel works engagement and larger demands for scrap. Machine shop turnings and the blast furnace grades are firm at recent prices, but there is not much demand for or strength in the foundry grades. The February scrap list of the Baltimore & Ohio contains 15,205 gross tons, the largest items being 3700 tons of miscellaneous rails, 1210 tons of destroyed steel cars and 1050 tons of No. 1 heavy melting steel.

We quote for delivery to consumers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$16.00 to $16.50
Scrap rails	15.50 to 16.00
No. 1 cast, cupola size	15.50 to 16.00
Compressed sheet steel	15.00 to 15.50
Bundled sheets, sides and ends	14.00 to 14.50
Railroad knuckles and couplers	18.00 to 18.50
Railroad coil and leaf springs	18.00 to 18.50
Low phosphorus blooms and billet ends	20.00 to 20.50
Low phosphorus mill plates	19.50 to 20.00
Low phosphorus, light grade	17.50 to 18.00
Low phosphorus punchings	18.00 to 18.50
Steel car axles	21.00 to 21.50
Cast iron wheels	16.00 to 16.50
Rolled steel wheels	18.00 to 18.50
Machine shop turnings	12.00
Short shoveling steel turnings	12.50 to 12.75
Sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	14.50 to 15.00
Short mixed borings and turnings	12.50 to 12.75
Heavy breakable cast	15.00 to 15.50
Cast iron borings	12.50 to 12.75
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	16.00 to 16.50
Railroad or automobile malleable scrap	16.00 to 16.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	$2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg	2.90
Cement coated nails, per keg	2.95

Industrial Finances

Directors of Foote Brothers Gear & Machine Co., Chicago, have placed the common stock of the company on an annual dividend basis of $1.20 a share as compared with the $1 annual rate that prevailed heretofore. Net earnings in 1926 after all charges were equal to $2.19 a share as compared with $1.07 a share in the previous year.

An involuntary petition in bankruptcy against the Flexway Corporation, Front and Pike Streets, Cincinnati, manufacturer of electric tools, has been filed in the United States District Court at Cincinnati. Upon the petitioners' application Philip Roettinger, Cincinnati attorney, was appointed receiver pending the final disposition of the bankruptcy proceedings.

The R. B. Lang Mfg. Co., Racine, Wis., maker of hardware specialties, sheet metal stampings, nickeled products, etc., has been placed in charge of a committee of creditors consisting of J. M. Sullivan, Wheeling Steel Corporation; P. W. Wehrle (or J. W. Jones), Unity Sheet Steel Co.; C. C. Gittings, Gold Medal Camp Furniture Co., and S. S. Nichols, Belle City Mfg. Co. R. W. Eastman, who has been serving as secretary, treasurer and general manager, has been appointed to serve as works manager and secretary of the creditors' committee. The operation of the plant will be continued for the present.

Earnings in 1926 of the Morse Twist Drill & Machine Co., New Bedford, Mass., after depreciation, were $152,332, leaving a surplus on Dec. 31 of $636,859, compared with $502,838 at the end of 1925.

Net profits in 1926 of the Walworth Co., Boston, and its subsidiaries, allowing for interest and depreciation, aggregated $561,908, equal after preferred dividends to $1.58 a share on the common stock, and compared with $683,306, or $2.08 a share on the common stock in 1925. Net sales in 1926 were $29,314,224.

Donner Steel Co., Inc., Buffalo, reports profit of $736,607 for the year ended Dec. 31, 1926, equivalent after depreciation, interest, Federal taxes, etc., to $24.55 a share on the $3,000,000 eight per cent preferred stock. This compares with $793,136 or $26.43 a share on the same stock in 1925.

Frank A. Scott, receiver of the Standard Parts Co., Cleveland, has filed the final report of his operations, beginning Sept. 1, 1920, and asked that he be discharged. The report shows that $7,417,496 or 76 per cent has been paid on claims allowed by the court, and that a final dividend of one per cent and all expenses connected with the estate have been paid. The report shows that a total of $26,481,961 was realized from the sale of various properties and equipment of the company and total cash disbursed exclusive of dividends paid to creditors of $19,064,465.

The Brock Engineering Corporation, Arcade Building, St. Louis, manufacturer of feedwater purifiers, has increased its capitalization from $100,000 to $200,000.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$34.00
Rerolling, under 4-in. to and including 1¾-in.	$34.50 to 35.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$34.00
Smaller than 8 in. x 2 in.	$34.50 to 35.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $44. Cleveland mill base, $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c. to 10.50c.
Iron ore, Swedish, average 66% iron	9.50c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $13.50
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2 delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.50
Foundry, f.o.b. Connellsville prompt	$4.50 to 5.00
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.50
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis	10.50

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.60 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.80 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.90 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.35 to 1.45
Gas slack, f.o.b. W. Pa. mines	1.50 to 1.60

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00
75%	145.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*
10% $34.00	12%	$38.00
11% 36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*
6% $26.50	10%	$32.00
7% 27.50	11%	34.00
8% 28.50	12%	36.00
9% 30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.08 to $1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$17.00 to $17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$38.00 to $40.00
Maryland	43.00 to 46.00	38.00 to 40.00
New Jersey	55.00 to 75.00	
Ohio	40.00 to 43.00	38.00 to 40.00
Kentucky	40.00 to 43.00	38.00 to 40.00
Illinois	40.00 to 43.00	35.00 to 38.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to 7.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 2 and 7 heads	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square,	4.00c. per lb. off list
Hot-pressed nuts, blank or tapped, hexagons,	4.40c. per lb. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
⅞ in. and smaller, U. S. S.	80, 10, 10 and 5
⅞ in. and larger, U. S. S.	75, 10, 10 and 5
Small sizes, S. A. E.	80, 10, 10, 10 and 5
S. A. E., ⅝ in. and larger	75, 10, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	U.S.S.		Per 100 Net S.A.E.	U.S.S.
¼-in.	$0.44	$0.44	⅝-in.	$2.35	$2.40
5/16-in.	0.515	0.515	⅞-in.	3.60	3.60
⅜-in.	0.62	0.66	1-in.	5.65	5.90
7/16-in.	0.79	0.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	19.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

	Base per 100 Lb.
F.o.b. Pittsburgh	$2.30 to $2.40
F.o.b. Chicago	2.60

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5 to 70 and 10
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws	80 and 10
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	50
Upset hex. head cap screws, U.S.S. thread,	80, 10 and 10
Upset hex. cap screws, S.A.E. thread,	80, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70 and 5

Chicago

Corporation Blows in Fifth Stack in Six Weeks—Better Plate Bookings

CHICAGO, March 1.—The Steel Corporation has blown in the fifth blast furnace in six weeks. The No. 1 stack at the South Chicago works was lighted March 1. The leading producer now has 20 out of 27 furnaces in blast, and the total count of steel works stacks for the district is 29 active out of 36.

Plate mill schedules are heavier as a result of liberal specifications from railroad equipment builders and orders for over 20,000 tons of tankage material. The demand for bars is well maintained, and schedules now in for March delivery from several units in the automotive industry show a 20 per cent increase over February. Specifications for plates, shapes and bars show a slight gain as compared with last week but the volume is not so heavy as it was during the middle of February. Total sales are keeping pace with shipments, and individual orders entered for rolling are larger, indicating a tendency on the part of buyers to anticipate future requirements a little further in advance.

The price situation remains unchanged except that producers are less inclined to accept small and mixed orders and they are more rigidly adhering to the 2c. price on plates, shapes and bars for desirable business in relatively large tonnages.

Structural awards include 3400 tons of steel for the addition to the Cook County, Ill., jail, and 3500 tons for an office building in Chicago. Estimates have been prepared on numerous large-tonnage projects and there are indications that construction programs this spring will be large, but in the meantime structural shops are operating at a low rate.

Pig Iron.—Sales of Northern iron during the week have definitely established the market at $20, base, local furnace. Buyers are showing interest in second quarter requirements, and it is the belief in some quarters that a general buying movement is getting under way. In Chicago the market shows a fair degree of strength, but in outlying territory competition is keen and prices lack stability. The B furnace at Mayville has been blown in and will take the place of the A furnace, which has been in steady operation for many months. The B furnace is the larger of the two, and therefore its going in and the A furnace being blown out leaves production larger than a week ago. A Chicago melter has taken 650 tons of Northern iron at $20, base Chicago. A melter in western Michigan has placed 1500 tons of foundry iron. Inquiries include a number of 500-ton lots for Chicago, western Illinois, southern Wisconsin and Iowa users. February shipments were about equal to those of the second month of last year. The silvery market is quiet, with buyers strongly resisting the present price schedule. A round tonnage of resale silvery, which was offered to the trade last week, is said to have been withdrawn from the market to be applied against old contracts.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.00
Northern No. 1 foundry, sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50; delivered at Chicago	27.04
Southern No. 2 (all rail)	$4.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	$1.50 to 22.50
Silvery, sil. 8 per cent	23.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Plates.—Two oil refiners in the Southwest have ordered 20,000 tons of tankage material from Chicago mills. Another lot, totaling 7500 tons, was taken by an Eastern producer. Pending inquiry for plates for tank construction aggregates not less than 10,000 tons, and several new projects are rapidly taking shape. About 15,000 tons of car steel will be required for 1385 underframes and car superstructure sets that have been ordered by the Chicago & North Western. The Great Northern has placed 300 gondola cars. The Pere Marquette is asking for prices on 1000 underframes for box cars that are to be built in its shops. In some quarters it is believed that this inquiry is a feeler and that eventually the Pere Marquette will come into the market for 1000 cars. Railroad equipment builders in the Chicago district are operating at between 65 and 70 per cent of capacity, and if this rate is not increased, present bookings will carry them well into June. New buying of plates is well in advance of a week ago, and there is a noticeable stiffening in prices on material for delivery in or close to Chicago. While 2c. to 2.10c., Chicago, still represents the market, the lower quotation applies more generally to desirable business of heavy tonnage. It is reported here that foreign plates are being offered at 1.85c., New Orleans. The freight rate to Chicago is 57c. per 100 lb. Sizes available are 62 in. to 125 in. wide and from ¼ in. to ⅝ in. thick.

The mill quotation on plates is 2c. to 2.10c. per lb. base, Chicago.

Ferroalloys. — Several hundred tons of foreign spiegeleisen have been placed with local users at $35, base New Orleans, or $42.56, delivered Chicago. Dealers in the domestic product are holding firmly to $37, Hazard, Pa., or $44.76, delivered. The ferromanganese market is quiet, and quotations are being based on $100, seaboard.

We quote 80 per cent ferromanganese, $107.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $44.76, delivered Chicago.

Structural Material.—Structural awards are unusually light, and for the most part projects that are now before the trade are marking time. Small fabricating shops are issuing light specifications, but orders to the mills from the large shops are averaging close to expectations for this time of the year. Both engineers' and architects' offices are busy, and many new projects are nearing the point where bids will be taken. Two bridges are being planned to span the Mississippi River; a $1,000,000 school building program is taking shape at St. Paul, Minn.; an office building at Dallas, Tex., will require more than 2500 tons, and several buildings and bridges in Oklahoma and Texas will take a round tonnage. Prices on plain material are steady at 2c. to 2.10c., Chicago.

The mill quotation on plain material is 2c. to 2.10c. per lb. base, Chicago.

Reinforcing Bars.—Awards of rail steel reinforcing bars are numerous. Up to the middle of February that commodity ranged in price from 2c. to 2.20c., Chicago, on orders taken by the mills. Several weeks ago Chicago dealers in billet steel reinforcing bars announced that they would take orders for rail steel on a schedule $4 a ton below that for billet steel. This was equivalent to a $2 a ton advance on rail steel bars in lots of 100 tons or more. The bulk of the hard steel bar tonnage placed in the past week represents business on which the mills had bid the old prices. Those quotations have now disappeared from the market, and dealers look for the rail steel reinforcing bar schedule to hold at 2.10c. to 2.55c., Chicago. Awards of billet steel reinforcing bars are confined to small tonnages, but the total of outstanding business bulks larger than a year ago at this time. Billet steel reinforcing bars are steady at 2.30c. to 2.75c., Chicago warehouse. Recent contracts and fresh inquiries are shown on page 661.

Bars.—Specifications for soft steel bars in February were just about equal to those in the second month of 1926. Both production and shipments have increased since the first of the year. Orders have more than kept pace with delivery schedules, and producers now have heavier backlogs than at any time in the past three or four months. Forge shops are heavily engaged, and automobile parts makers are planning increased production schedules for March. Although the market on mild steel bars still ranges from 2c. to 2.10c., there is a definite swing away from the lower quotation except for desirable business of more than average size. Orders for iron bars are small, and producers are operating on a hand-to-mouth basis. Sev-

eral orders have been taken during the week at 2c., Chicago. Specifications for alloy steel bars for March delivery indicate that users are planning heavier production. The General demand for rail steel bars is more active, and prices are reasonably steady at 1.90c. to 2c., Chicago. Order books are not large, but current business is of such proportions as to permit both Chicago Heights mills to operate on double turn. Stocks in the hands of users are small, and the demand for prompt delivery is insistent. Liberal orders have been received from manufacturers of barn equipment, and specifications and new business in fence posts are fully 75 per cent heavier than a week ago. The farm implement trade is spotty, plants making seeders and tractors being the largest buyers at this time.

The prices per lb. are: Mild steel bars, 2c. to 2.10c. base, Chicago; common bar iron, 2c. base, Chicago; rail steel bars, 1.90c. to 2c. base, Chicago.

Hot-Rolled Strip.—Orders are fairly numerous, and prices are gaining strength. Chicago quotations range from 2.50c. to 2.60c. for strips narrower than 6 in. and from 2.30c. to 2.50c. for wider material.

Rails and Track Supplies.—Chicago mills have booked 5000 tons of standard section rails in miscellaneous orders, which ranged from 500 to 1500 tons each. Orders for light rails are small. Specifications for track accessories are liberal, but orders for the week cover only 2000 tons of steel tieplates, which are for an Eastern railroad with a terminal at Chicago. The Southern Pacific, which several weeks ago placed a large order for track supplies, again entered the market and contracted with mills outside of Chicago for a sizable tonnage of spikes, bolts and angle bars. Production schedules that were planned last fall are being adhered to, and railroads are taking rails at a rate close to 85 per cent of mill capacity.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

Sheets.—Orders and specifications in February were fully 30 per cent heavier than in January. Contracting so far this year has been slow, but fresh inquiry received late in the week indicates that users are beginning to consider future requirements as far ahead as July. Of the three products, black, galvanized and blue annealed sheets, the last is in the greatest demand, and deliveries on that commodity show a tendency to lengthen. Orders for black sheets are heavier, and the price has stiffened, quotations now ranging from 3c. to 3.10c., delivered Chicago. Sheet production in this district is close to 85 per cent.

Chicago delivered prices from mill at 3.00c. to 3.10c. for No. 24 black; 2.35c. to 2.40c. for No. 10 blue annealed; 3.90c. to 4c. for No. 24 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Products.—Producers of wire products have opened their books for second quarter. Specifications from the manufacturing trade are steady, while orders from jobbers are larger in number and in size. Producers are moving cautiously and are drawing on stocks for the increased demand instead of stepping up mill production, which now stands a trifle above 60 per cent of capacity. Fair quantities of fencing are now moving to the South, Southwest and the South Central States. Demand for nails shows marked improvement as spring building programs get under way.

Bolts, Nuts and Rivets.—Specifications have shown a sharp upturn, and spot buying is more active than at any time so far this year. It is reported that the proposed revision of discounts will go into effect April 1 and that second quarter contracts will be based on the new schedule.

Cast Iron Pipe.—Prices have stiffened, and $36, Birmingham, or $44.20, delivered Chicago, represents the bottom of the market on 6-in. and larger diameter pipe. Both contracts and new inquiries are in large volume, and on most sizes producers are not promising better than 60-day to 90-day deliveries. The National Cast Iron Pipe Co. has taken 1000 tons for Dayton, Ohio, and several hundred tons for Youngstown, Ohio. Detroit will open bids March 3 on 6300 tons of 6-in. Class B pipe, and Saginaw, Mich., has received tenders on 500 tons of 6 to 24-in. pipe. Akron, Ohio, will receive tenders March 7 on 700 tons of 6-in., 200 tons of 8-in., 700 tons of 12-in. and 900 tons of 16-in. pipe. Center Line, Mich., will buy 230 tons of 6-in. and 750 tons of 8-in. Class B pipe. The W. J. Newman Construction Co., Chicago, is low bidder on a $300,000 project at Highland Park, Ill.

We quote per net ton, delivered Chicago, as follows: Water pipe, 4-in., $48.20 to $49.20; 6-in. and over, $44.20 to $45.20; Class A and gas pipe, $4 extra.

Old Material.—The market is inactive, and dealers are finding it more difficult to place tonnage when it comes on track. Yard operations in Chicago have been reduced to a minimum, but country dealers continue to prepare scrap on a scale that is not warranted by the general consumptive demand. Many contracts are nearing completion, and trading among dealers has slowed down from a week ago. Prices lack strength, and there is little to support the impression of a few that the market has reached bottom. On the whole, users have ample stocks, and with dealers pressing sales of scrap as it appears on track, there can be little doubt that prices are leaning toward the weak side. Railroad offerings include blank lists from the New York Central and the Michigan Central, 50,000 tons advertised by the Pennsylvania Railroad and 4800 tons offered by the Chicago, Milwaukee & St. Paul.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Heavy melting steel	$12.75 to $13.25
Frogs, switches and guards, cut apart, and miscellaneous rails	14.25 to 14.75
Shoveling steel	12.75 to 13.25
Hydraulic compressed sheets	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
Forged cast and rolled steel carwheels	16.25 to 16.75
Railroad tires, charging box size	17.00 to 17.50
Railroad leaf springs, cut apart	16.25 to 16.75
Steel couplers and knuckles	15.50 to 16.00
Coil springs	16.50 to 17.00
Low phosphorus punchings	15.50 to 16.00
Axle turnings, foundry grade	13.00 to 13.50
Axle turnings, blast fur. grade	10.00 to 10.50
Relaying rails, 56 to 60 lb.	25.50 to 26.50
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails	15.50 to 16.00
Steel rails, less than 3 ft.	16.50 to 17.00
Iron rails	13.50 to 14.00
Cast iron borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	14.75 to 15.25
Angle bars, steel	14.50 to 15.00
Cast iron carwheels	15.00 to 15.50
Per Net Ton	
No. 1 machinery cast	16.50 to 17.00
No. 1 railroad cast	15.50 to 16.00
No. 1 agricultural cast	14.00 to 14.50
Stove plate	13.25 to 13.75
Grate bars	13.75 to 13.25
Brake shoes	13.00 to 13.50
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	21.50 to 22.00
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	10.25 to 10.75
No. 2 busheling	7.00 to 7.50
Locomotive tires, smooth	16.00 to 16.50
Pipes and flues	8.00 to 8.50

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 24 black sheets	3.05c. to 3.15c.
No. 10 blue annealed sheets	2.40c. to 2.45c.
No. 24 galvanized sheets	3.90c. to 4.00c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, squares, tapped or blank,	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank,	3.75c. off per lb.
No. 8 black annealed wire, per 100 lb.	$3.30
Common wire nails, base per keg	3.05
Cement coated nails, base per keg	3.05

New York

Pig Iron Buying Sustained—Steel Prices Steadier

NEW YORK, March 1.—In another week of active buying in the pig iron market the bulk of the business placed went to Buffalo furnaces or to producers quoting on a Buffalo base. These makers not only dominate the market in the New York metropolitan district but have penetrated deep into the home territory of eastern Pennsylvania furnaces. The lion's share of a recent order in Pennsylvania was placed at a flat price of $17, Buffalo, for both No. 2 plain and No. 2X, or a delivered price of $21.54. The remainder, a small tonnage of No. 2 plain, was purchased at $21.63, delivered, or $20.50 at the nearest eastern Pennsylvania furnace. Sales by local brokers in the past week exceeded 16,000 tons, and while there is still some attractive tonnage pending, most of the large buyers have covered their needs through the second quarter and into the third. Having acquired comfortable backlogs, some of the furnaces are taking a firmer attitude on prices. There is less of a tendency to quote below $17. Buffalo, even if silicon differentials are waived on some of the higher grades of foundry. The Essex Foundry, Newark, N. J., has closed for 3000 tons of foundry, and the Worthington Pump & Machinery Corporation placed 1200 tons for its Harrison, N. J., plant. The Burnham Boiler Corporation, Irvington, N. Y., has bought 1000 tons of foundry for its Lancaster, Pa., works. The A. P. Smith Mfg. Co., East Orange, N. J., has purchased 630 tons of foundry for June, July and August deliveries. In New England 2000 tons of foundry was placed by the Westinghouse Electric & Mfg. Co. for its Springfield, Mass., plant. The Newport News Shipbuilding & Drydock Co., Newport News, Va., has bought 300 tons of low phosphorus iron from a domestic producer. The Worthington Pump & Machinery Corporation has put out additional inquiries as follows: 670 tons for Holyoke, Mass., 2300 tons for Harrison, N. J., and 900 tons for Elmwood Place, Ohio. Another fresh inquiry from a melter in this district calls for 2500 tons of foundry and malleable for second quarter. Very little foreign iron is penetrating this market, and the increase in duty to $1.12½ per ton, effective March 25, will make it even more difficult for importers to make sales under the highly competitive conditions that have been prevailing. Comparatively small tonnages of high silicon foundry of foreign make, notably Dutch iron, continue to be bought for mixture purposes.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices, $1.39 to $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$21.89 to $23.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	21.91 to 22.41
No. 2 Virginia fdy., sil. 1.75 to 2.25	26.54 to 27.04

Ferroalloys.—There is one inquiry for 300 to 500 tons of ferromanganese from one consumer with a few inquiries for carloads and small lots. Several small lot sales are noted, but there is no heavy demand. Specifications on contract are good. There is no change in the spiegeleisen situation, the demand continuing in fair volume for moderate quantities and with specifications satisfactory. Prices for both alloys continue unchanged and firm.

Finished Steel.—Steel prices have not strengthened but they are steadier at about the same levels as in the past two weeks. There is a slight improvement in the volume of business, affecting particularly structural shapes and sheets. In the latter there has been some second quarter contracting at $1 or $2 a ton above the low points which have recently been reached. For early shipment the following prices now quite generally rule on sheets: 2.75c. to 2.85c. on black; 2.15c. to 2.20c. on blue annealed, and 3.60c. to 3.70c. on galvanized. Small or undesirable lots are frequently quoted higher. Structural steel awards are more numerous and involve fairly large tonnages, including 25,000 tons for an office building adjacent to Grand Central Terminal, New York. In plates, there is no marked improvement in the volume of business, but day-to-day orders are at about the same rate as in recent weeks. Mills continue to quote 1.90c., Pittsburgh, on miscellaneous business, and reports indicate that none but special buyers, such as car builders, shipbuilding companies and large oil companies, are getting anything below that figure. Wire products are now steady at 2.40c. for plain wire and 2.55c. for wire nails.

We quote mill shipments, New York delivery, as follows: Soft steel bars, 2.24c. per lb.; plates, 2.14c. to 2.24c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	5.75c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread	40, 10 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40, 10 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	4	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Reinforcing Bars.—Bookings during the week were small and no large tonnages were involved. A railroad bridge at Jersey City, scheduled to be let before the end of the week, will aggregate several hundred tons, and a warehouse in New York for which plans are being prepared will require about 1000 tons. Prices are unchanged.

Mill prices on billet steel reinforcing bars are: 2c. per lb. base, Pittsburgh. Reinforcing bars out of New York warehouse are quoted at 3.15c. per lb. delivered at job, and out of Youngstown warehouse at 2.50c., Youngstown, or 2.87½c., delivered New York.

Cast Iron Pipe.—Most of the current activity is in water pipe, with a moderate volume of purchasing by municipalities. While Northern makers have endeavored to maintain prices, producers in the South have been keen competitors for tonnage and as low as $35 per ton, base Birmingham, is reported, with $36 and $37 per ton rather generally obtainable. Bids opened Feb. 24 by the Department of Purchase, New York, on 10,000 tons of pipe, resulted in low bids by the United States Cast Iron Pipe & Foundry Co. on 4700 tons, by the Donaldson Iron Co. on 2000 tons, by R. D. Wood & Co. on 2000 tons and by the Warren Foundry & Pipe Co. on 1700 tons. The low bid on 300 tons of water pipe for Medford, Mass., is reported to have been submitted by the Donaldson Iron Co. Stone & Webster, Inc., Boston, recently closed on about 2000 tons of pipe for shipment to points in Massachusetts, Connecticut and Rhode Island. On the recent opening of bids by Albany, N. Y., on 2000 tons of water pipe, B. Nicoll & Co., representing the Pont-a-Mousson works, were low. Clyde Potts, 30 Church Street, New York, recently opened bids on 2000 tons of water pipe for Morristown, N. J.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $46.60 to $48.60; 4-in and 5-in., $51.60 to $53.60; 3-in., $61.60 to $63.60; with $5 additional for Class A and gas pipe.

Coke.—While there is an active demand for coke, particularly foundry grade, sellers who also handle pig iron point out that on the basis of pig iron consumption most of this fuel is apparently for current use. Prices continue at about $4.50 to $5 per ton, Connellsville, for foundry grade and $3.50 to $4 per ton for furnace. Delivered prices of foundry coke are: To northern New Jersey, $8.53 to $9.53; New York or Brooklyn, $9.29 to $10.29; Newark or Jersey City, N. J., $8.41 to $9.41 per ton. By-product foundry coke is unchanged at $9.59 to $10.77 per net ton, delivered Newark or Jersey City, N. J.

Warehouse Business.—The total of business in February was smaller than in January, but only because it was a shorter month with two holidays. Purchasing of structural material from stock is increasing, but tonnages are still small, seldom exceeding 4 or 5 tons. Black and galvanized sheets are quite firm, but blue annealed continue to show some weakness when a large lot is involved. Recently the warehouses in this district returned to the mill schedule of extras on Bethlehem girders, columns and I-beams instead of charging the double premium, which has been the practice for some time. For example, an extra of 40c. per 100 lb. has been the usual charge on an 8-in. Bethlehem column, and 10c. per 100 lb. on a Bethlehem I-beam up to 15 in. The extra on columns has been reduced to 20c. per 100 lb. and the extra on I-beams to 5c. per 100 lb., which are the differentials charged by the mill.

Old Material.—Prices of all grades continue soft, with brokers offering less, based on recent sales to consumers. No. 1 heavy melting steel continues unchanged at $14.50 to $15 per ton, delivered eastern Pennsylvania, but yard steel is not quotable at more than $12 per ton, delivered, and a broker with a large contract for borings and turnings is quoting $10.50 per ton, delivered Bethlehem, Pa. Heavy breakable cast continues to be purchased at $13 per ton, New York, for shipment to a Florence, N. J., consumer, but on shipment to eastern Pennsylvania users, the market is about $15.50 per ton, delivered. Railroad malleable is being shipped to a Bridgeport, Conn., user at $15.50 per ton, delivered. Cast borings are being purchased at $12 per ton, delivered, to an eastern Pennsylvania user with a $3.78 per ton freight rate.

Buying prices per gross ton, New York, follow:

No. 1 heavy melting steel	$11.00 to	$11.85
Heavy melting steel (yard)	8.25 to	8.50
Rails for rolling	11.50 to	12.00
Steel car axles	16.50 to	17.00
Iron car axles	24.00 to	24.50
No. 1 railroad wrought	12.50 to	13.50
No. 1 yard wrought, long	11.50 to	12.50
Forge fire	8.00 to	8.50
Cast borings (steel mill)	8.00 to	8.25
Cast borings (chemical)	12.50 to	13.00
Machine shop turnings	7.75 to	8.25
Mixed borings and turnings	7.50 to	8.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)		9.75
Stove plate (steel mill)	8.50 to	8.75
Stove plate (foundry)	10.50 to	10.75
Locomotive grate bars	9.50 to	10.00
Malleable cast (railroad)	13.00 to	13.50
Cast iron carwheels	11.00 to	11.50
No. 1 heavy breakable cast	11.75 to	13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$15.00 to	$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to	14.00
No. 2 cast (radiator, cast boilers, etc.)	12.50 to	13.00

Cleveland

Pig Iron Prices Raised 50c.—Further Gain in Steel Buying

CLEVELAND, March 1.—Business in finished steel shows a further gain, and the feeling in the trade is more optimistic than it has been for some time. Consumers appear to have more confidence in the stability of prices and are showing an inclination to make more extended commitments. This is indicated in the placing of some contracts for steel bars, plates and structural material covering requirements through the second quarter, which mills have taken at the ruling prices. Some of the mills are taking a firmer stand on prices for small lots and are now asking 2c., Pittsburgh, for steel bars, plates and structural material in car lots. Attempts were made a few months ago to establish a $2 a ton differential for car lots, but this advance was not long generally maintained.

A further increase in production schedules was made March 1 by a number of the Michigan automobile manufacturers, and this industry with a few exceptions is operating well. While motor car builders are ordering steel freely, they continue to take it only for early requirements. Lake shipyards have received inquiries for a Lake boat, requiring 3000 tons of steel, and for five barges for the New York State Barge Canal, requiring 4000 tons. In the building field not much work is coming out, nor is there a great deal in prospect.

Local mills quote steel bars at 1.90c., Cleveland, the price of 2c., Cleveland, having disappeared. Outside mills are holding to 1.90c., Pittsburgh, for steel bars, plates and structural material.

Pig Iron.—The market continued active the past week, and Lake furnaces in Ohio are now so well filled for the second quarter that they have advanced prices 50c. a ton. This brings the minimum price of foundry and malleable iron in Cleveland to $18 at furnace, with one producer asking $18.25 to $18.50. The Valley market has also stiffened up, due to the fact that one pro-

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Reinforcing steel bars	2.75c. to 3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 24 black sheets	3.65c.
No. 10 blue annealed sheets	3.15c.
No. 24 galvanized sheets	4.50c.
Cold-rolled strip	*5.95c.
No. 9 annealed wire, per 100 lb.	$2.90
No. 9 galvanized wire, per 100 lb.	3.35
Common wire nails, base, per keg	2.90

*Net base, including boxing and cutting to length.

ducer who has been quoting $18, furnace, has advanced to $18.50. For Cleveland delivery local furnaces have marked up their prices 50c. to $19 at furnace. In Michigan the market is unchanged at $19, furnace. Sales by Cleveland interests during the week aggregated 60,000 tons, or somewhat more than during the previous week. Inquiry has dropped off, and as most of the large consumers are now covered for the second quarter, a tapering off in sales is expected. Some consumers evidently have bought enough iron to carry them well into the third quarter, apparently believing that they would not make a mistake in covering at the low prices that have been prevailing. A few sizable inquiries have come out for the third quarter, but none of the furnaces appears willing to quote for that delivery. A new buyer of basic iron appeared during the week when the Timken Roller Bearing Co., Canton, Ohio, purchased approximately 7000 tons from an Ohio furnace having a freight rate somewhat lower than the Valley rate. The Timken company, which heretofore has made only electric steel, will place a 100-ton open-hearth furnace in operation this month. The Westinghouse Electric & Mfg. Co. placed 1000 tons of foundry iron for its Cleveland plant with a Cleveland producer, and considerable other business was placed during the week by Cleveland consumers, including two 2000-ton lots. One Cleveland producer took several orders for shipment to southern Ohio and Indiana, including a 4000-ton lot for the latter State. The market in Michigan, which has shown less life recently than in Ohio and Indiana, developed considerable activity during the week. This is attributed to the increased activity of the automotive industry, as much of the buying came from that source.

Quotations below are per gross ton and except on basic and low phosphorus iron, are delivered Cleveland, including a 50c. switching charge for local iron. Ohio silvery and Southern iron prices are based on a $3 freight rate from Jackson and $6 from Birmingham:

Basic, Valley furnace	$18.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25.	19.50
Southern fdy., sil. 1.75 to 2.25	24.00
Malleable	19.50
Ohio silvery, 8 per cent	31.50
Standard low phos., Valley furn.	28.00

Semi-Finished Steel.—There is not much new demand, as consumers as a rule are under contract. Specifications are good. Prices appear well established at $34, Cleveland, for sheet bars, billets and slabs, there being no differential for sizes.

Sheets.—Additional business in fair-sized lots was placed during the week by the automotive industry, and the demand from that source is fairly heavy. Orders from other consumers are fair. With prices still irregular the market does not appear any stronger than it has been recently. On black sheets 2.90c., mill, is the more common quotation, although 2.75c., Pittsburgh, is being named, and some business was taken in Cleveland during the week at 2.90c., delivered. On blue annealed sheets sales are reported at 2.10c., Pittsburgh, although a price of 2.05c. is still coming out occasionally. The more common range quoted by Ohio mills is 2.15c. to 2.25c., mills. Galvanized sheets are selling in car lots at 3.75c., mill. In spite of reports of occasional shading to 4.10c. on automobile body sheets, the price of 4.15c. is being well maintained and is being paid by large consumers.

Strip Steel.—The recent advance in prices to 2.10c., Pittsburgh, for wide strip and 2.30c. for narrow stock will not apply to much second quarter tonnage, as most consumers were allowed to cover at the old prices before the advance and placed orders for rather extended requirements at 1.85c. to 1.90c., base, and in some cases at net prices that figured considerably lower. A heavy tonnage was booked at the old prices. Makers of cold-rolled strip are getting a good volume of business from the automotive industry at the recent range in prices of from 2.85c. to 3c., Cleveland.

Reinforcing Bars.—With the approach of the building season, inquiries for small lots show some increase. Rail steel bars are unchanged at 1.70c. to 1.80c., mill. On new billet steel bars the usual quotation is 1.90c., Cleveland.

Warehouse Business.—Sales show some gain from week to week, the improvement being more noticeable in steel bars than in other products. Prices are firm except on sheets, which are moving rather slowly.

Iron Ore.—Consumers are showing virtually no interest in the ore market, and sellers do not look for any activity for several weeks. No inquiry has yet come from the Ford Motor Co. or other buyers. The Ford company for several years has sent out the first inquiry. Last year the market opened with the establishment of prices on March 17.

Coke.—One Connellsville producer has opened its books for the second quarter for premium foundry coke at $5.50, ovens, its contracts to include a wage clause. Standard makes are quoted at $4.50, ovens, for prompt shipment. Demand is rather slow.

Fluorspar.—The demand for small lots shows improvement. The market is firm, several sales having been made in the past week at the regular quotations.

Bolts, Nuts and Rivets.—The demand for bolts and nuts has shown a further gain. A good volume of business is coming from the automotive industry, and jobbers also are ordering rather freely. The new price lists and discounts for bolts, nuts and lag screws that are to become effective April 1 are expected to be issued this week. These will result in some price readjustments, as the plan is to base prices on present production costs. Some bolts will be advanced and others reduced, the reductions being more generally on smaller sizes. The rivet market does not show much life.

Old Material.—Increased motor car production is being reflected in larger scrap offerings by the Michigan automobile companies. The Chevrolet Motor Co. closed a few days ago on a list of 6800 tons, and the Buick Motor Co. closed on a list of 7600 tons. Several smaller lists have been issued by other General Motors Corporation units, and Dodge Brothers, Inc., and the Chrysler Corporation will receive bids March 1 for 4000 tons and 3000 tons, respectively. There is virtually no activity on the part of consumers, but dealers are still buying heavy melting steel scrap and borings and turnings for a Cleveland consumer, for which they are paying the quoted prices. The market appears stabilized at present price levels. There is no local demand for machine shop turnings, and Cleveland dealers are finding a market for these in Youngstown and Warren, paying $9 to $9.10 for shipments to those points. One local steel plant has suspended shipments for six weeks because of a shut-down for work in its plant.

We quote per gross ton, delivered consumers' yards in Cleveland:

Heavy melting steel No. 1	$14.50 to $14.75
Heavy melting steel No. 2	14.00 to 14.25
Rails for rolling	16.25 to 16.50
Rails under 3 ft.	18.00 to 18.50
Low phosphorus billet, bloom and slab crops	18.00 to 18.50
Low phosphorus sheet bar crops.	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Low phosphorus forging crops	16.50 to 17.00
Cast iron borings	11.50 to 11.75
Machine shop turnings	9.00 to 9.25
Mixed borings and short turnings	11.50 to 11.75
Compressed sheet steel	13.75 to 14.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	12.50 to 13.00
No. 1 cast	16.00 to 16.50
No. 1 busheling (new)	13.00 to 13.25
No. 2 busheling	11.50 to 11.75
Drop forge flashings, 15 in. and under	14.00 to 14.50
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Pipes and flues	10.00 to 10.50

Proposed Merger of Ohio Sheet Mills Fails

YOUNGSTOWN, March 1.—W. A. Thomas, independent sheet maker, announced today that the proposed merger of six sheet producers in the Middle West had been definitely called off through failure to agree upon valuation terms and other details. An effort will still be made to amalgamate some of the proposed Mahoning Valley constituents.

Philadelphia

Steel Orders Show Slight Increase—Pig Iron and Scrap Markets Weak

PHILADELPHIA, March 1.—Orders for structural shapes, steel bars and sheets have increased in number and volume during the past week, and the mill situation is slightly better, although no backlogs are being built up. With the possible exception of structural shapes, prices on most lines of finished steel are steadier, but are no higher.

The pig iron market is fairly steady so far as the immediate Philadelphia district is concerned, but in sections where eastern Pennsylvania iron comes into closer competition with New York State iron the furnaces of this district find it necessary to make concessions or lose business.

Scrap continues in the dull course of the past several weeks, the only new note being that movements from New England have slowed up somewhat on account of recent heavy snowfall in that section, which has interfered with loading of cars although transportation has not been impeded. Scrap prices are weak, and there are some reductions.

Pig Iron.—With New York State pig iron selling at $17, base Buffalo, for foundry grades, eastern Pennsylvania furnaces are coming into sharper competition with iron from that district in northern New Jersey and northern Pennsylvania. A foundry at Kutztown, Pa., bought about 1000 tons of No. 1X Buffalo iron from two steel companies at $22.66, delivered, equivalent to $18.25, Buffalo, the freight rate being $4.41 per ton. Even with a freight rate of $4.91 to points nearer Philadelphia, the Buffalo furnaces sometimes have an advantage as compared with a base price of $21, eastern Pennsylvania furnace. Some furnaces of this district have not attempted to meet this competition, but others have done so by making concessions of about 50c. a ton. During the past week there have been miscellaneous sales of Bessemer and foundry grades, amounting in all to several thousand tons, but the business has not been evenly divided. Two furnace companies report that the past week has been one of the dullest in some time. The soft coal strike scheduled for April 1 has had little effect either on the attitude of buyers or sellers. The former seem in no fear that iron will not be freely available, while sellers are committing themselves into second quarter without regard to any possible effects of the strike on the coke market.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic, delivered eastern Pa.	21.00 to 21.39
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
*Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17 to 26.67
*Virginia No. 2X, 2.25 to 2.75 sil.	26.67 to 27.17

*The freight rate from Virginia furnaces to Philadelphia is $5.17 per gross ton.

Ferromanganese.—Sales are confined to small lots. Quotations on domestic and imported alloy remain at $100, seaboard.

Plates.—Buying of plates is not showing any improvement, and the best that can be said is that some mills are able to maintain the recent level of operations, while others are running at a slightly reduced rate. On miscellaneous orders 1.90c., Pittsburgh, is quoted by Eastern mills, and it is only the most favored buyers, such as car builders and shipbuilding companies, that are able to obtain any concession from that figure.

Structural Shapes.—Eastern mills have received in the past week a larger volume of business. This is a reflection of the increased amount of contracting for spring building work. The price situation, however, is chaotic in that nearly every transaction is a law unto itself. On the ordinary run of miscellaneous carload orders, mills are quoting from 1.80c. to 1.90c., Pittsburgh, but on large lots lower prices are obtainable, as has been the case for some time. Sales at 2c., delivered, equivalent to 1.68c., Pittsburgh, have not been uncommon, and even lower than that figure has been given to buyers of very attractive tonnages.

Bars.—Orders for steel bars are increasing in number, the aggregate being quite an improvement over earlier weeks of the year. Some mills are again asking 2c., Pittsburgh, on small lots, but 1.90c., is the usual quotation on a carload or more.

Old Material.—Consumers are showing little interest in the scrap market. Transactions are almost wholly between producers or dealers and brokers who have contracts to complete. The movement of scrap, which has been steady despite low prices, has slowed up, the theory being that some producers and dealers are holding their accumulations for more satisfactory prices, which do not seem to be immediately in sight. Heavy snows in New England have delayed the loading of scrap in that district, although railroad transportation has not been seriously affected. Some brokers are having more difficulty in filling contracts than was anticipated. Borings and turnings are not coming out as freely as a few weeks ago, the explanation being that production in some plants has not been as large as during most of last year.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$14.50 to $15.00
Scrap T rails	14.00 to 14.50
No. 2 heavy melting steel	12.50 to 13.00
Steel rails for rolling	16.50 to 17.00
No. 1 low phos., heavy, 0.04 per cent and under	19.50 to 20.00
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Cast iron carwheels	16.00 to 16.50
No. 1 railroad wrought	17.00 to 17.25
No. 1 forge fire	12.50 to 13.00
Bundled sheets (for steel works)	11.50
No. 1 blast furnaces scrap	10.50 to 11.00
Machine shop turnings (for steel works)	11.50
Machine shop turnings (for rolling mill)	12.00 to 12.50
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mill)	12.00 to 12.00
Cast borings (for chemical plant)	15.00 to 16.50
No. 1 cast	17.00 to 17.50
Heavy breakable cast (for steel works)	15.00 to 15.50
Railroad grate bars	12.25 to 13.00
Stove plate (for steel works)	12.25 to 13.00
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	18.50 to 19.00
Steel axles	21.00 to 22.00

Sheets.—One company reports that its orders for sheets in the past week were the largest of any week

(*Concluded on page 685*)

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¼-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.90c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.20c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ⅜-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 24 black sheets	4.15c.
No. 10 blue annealed sheets	3.30c.
No. 24 galvanized sheets	5.10c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.
Tool steel	8.50c.

San Francisco

Ocean Rates on Steel May Advance — 4000 Tons of English Coke Sold

SAN FRANCISCO, Feb. 26 (*By Air Mail*).—Despite the holiday and heavy rains, business has been active during the past week, particularly in structural material and in coke. In the latter department of the market there has been large buying. One local importer booked 4000 tons of English coke at competitive prices for late March and early April deliveries. In addition, 3000 tons of German by-product has been delivered to users here and in Los Angeles.

Higher ocean freight rates on steel shipped from Atlantic ports via the Panama Canal to the Pacific Coast are expected to become effective about April 30. It is understood that some of the intercoastal steamship companies contemplate making an advance in freight rates of about 15c. per 100 lb. If the change is made, a rate of 40c. will apply on steel. The present rate is about 25c.

Pig Iron.—Local importers are concerned over the increase in the duty on pig iron by Presidential proclamation in accordance with the flexible provisions of the tariff act. Comparatively little foreign iron has come in at this port of late, although a local importer receives regular shipments from India, totaling about 500 tons a month. At present, buying is sluggish. A local importer is quoting on English iron for the first time in nearly a year, but he is making quotations on specific inquiries for second quarter shipments only.

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25.	25.00
**German foundry, sil. 2.75 to 3.25.	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Structural lettings for the week total 4582 tons. The largest individual job, 1400 tons for an apartment building in Oakland, Cal., was taken by the Pacific Coast Engineering Co. Bids on 275 tons for a telephone exchange building in Oakland have been postponed for about one month. In San Francisco a boxing arena will require about 300 tons. Most of the inquiries that have come out during the week call for relatively small tonnages. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—Bids have closed on 2100 tons of plates for the Feather River Power Co., San Francisco, for the Bucks' Creek development project. The Southern Pacific Co., San Francisco, has placed 800 tons for boiler work with an Eastern mill. The Atlantic, Gulf & Pacific Co., San Francisco, has bought 300 tons of plates, bars and angles from an unnamed Eastern mill for warehouse stock in Manila, P. I. Plans are completed and bids are expected to be called for soon by the East Bay Municipal Utility District, Oakland, Cal., on about 1500 tons of plates for additional pipe line work for the Mokelumne River project. Eastern mill quotations show no signs of strengthening. While most of the mills continue to quote desirable tonnages at 2.25c., c.i.f. Coast ports, and the general run of orders at 2.30c., it is understood that 2.25c. has been named more than once recently on moderate-sized lots.

Bars.—The only letting of importance in reinforcing bars during the week was 900 tons for a department store in Seattle, Wash., taken by the Pacific Coast Steel Co. About 1400 tons of bars will be required by the Feather River Power Co., San Francisco, for its Buck's Creek development project. Local reinforcing bar jobbers quote as follows: 2.85c., base, per lb., on lots of 200 tons, and 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—B. Nicoll & Co. have taken 1296 tons of 24-in. Class D pipe for the city of Seattle, Wash. French pipe will be furnished. The city of Los Angeles will open bids March 1 on a total of 5300 tons. Of this amount 4000 tons is 6-in. Class B pipe and 1300 tons is 4-in. Class B. Quotations are down $2 to $3 a ton. Eastern producers are now quoting about $46 to $48, base, f.o.b. dock San Francisco.

Warehouse Business.—Heavy rains and the holiday of the past week have retarded business. However, jobbers' sales this month have been fairly large and, in some cases, considerably ahead of last year. Quotations are unchanged.

Coke.—A local importer has booked orders for 4000 tons of English coke for late March and early April deliveries. Importers of German by-product fuel have delivered 3000 tons to users here and in Los Angeles during the past two weeks. Quotations are given on specific inquiries only.

Old Material.—While individual orders for the second quarter are small, the aggregate is fairly substantial. Stocks on hand apparently are adequate for all current needs. Quotations are unchanged.

Prices for scrap delivered to consumers' yards are as follows:

	Per Gross Ton
No. 1 heavy melting steel	$10.50 to $11.00
Scrap rails, miscellaneous	10.50 to 11.00
Rolled steel wheels	10.50 to 11.00
Couplers and knuckles	10.50 to 11.00
Country mixed scrap	7.00 to 8.00
Mixed borings and turnings	6.00 to 6.50

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars and small angles	3.00c.
Small angles, ⅞-in. and over	3.00c.
Small angles, under ⅞-in	3.40c.
Small channels and tees, ⅝-in. to 2¾-in.	3.60c.
Spring steel, ¼-in. and thicker	5.00c.
No. 24 black sheets	4.70c.
No. 28 black sheets	5.15c.
No. 10 blue annealed sheets	3.75c.
No. 24 galvanized sheets	5.25c.
No. 28 galvanized sheets	6.15c.
Common wire nails, base per keg	$3.75
Cement coated nails, 100-lb. keg	3.75

Birmingham

Await Second Quarter Buying Movement in Pig Iron—Steel Demand Steady

BIRMINGHAM, March 1.—Pig iron producers in Alabama are looking for a buying movement for second quarter to set in shortly. The impetus in buying early in the year, following the announcement of a $2 a ton reduction in prices, brought the furnaces business covering most of their first quarter output. Two blast furnaces were brought into commission and the surplus stock on yards, which had increased some in December, was drawn upon to take care of deliveries. Sales recently have been in small lots but numerous. Deliveries on present obligations will extend over into the second quarter, but a new buying movement to cover the probable production of that period is awaited. A survey of the melt indicates that some of the larger shops have orders on hand that will warrant steady operation for several months while improvement is looked for in other circles. Business in pressure pipe is especially promising. There continues to be steady production in basic iron, and with few exceptions the open-hearth furnaces in this district are in operation. Eleven blast furnaces are making basic iron, 11 are on foundry, and one is on ferromanganese. The Sloss-Sheffield Steel & Iron Co. is pushing the building of its No. 2 city furnace and in a few weeks will be ready to put it in service on foundry iron.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil	$18.00
No. 1 foundry, 2.25 to 2.75 sil	18.50
Basic	18.00
Charcoal, warm blast	29.00

Rolled Steel.—While business is lagging with a few mills and shops, the steel trade generally is active. Rails, for instance, are being rolled at the capacity of the Ensley mill. Railroad track accessories, wire and nails and plates are among other products in active demand. Business in lighter forms of steel has shown improvement recently, and shipments are picking up.

Structural fabricating shops in this district are not so busy as some time ago. Birmingham is still turning out a considerable tonnage of steel tanks, however. Mill prices remain unchanged except on tank plates, which are now quoted at 1.95c. to 2.05c., base Birmingham.

Cast Iron Pipe.—Plants making centrifugal pressure pipe are operating at capacity. While pipe lettings the past week were not so large as in previous weeks, unfilled tonnage is heavy, warranting steady production. Pressure pipe is quoted at $36 to $37, Birmingham, for 6-in. and larger diameters.

Coke.—The market has shown slight improvement, although warm weather has tended to curb demand. Quotations are firm at $5.50, Birmingham, for by-product foundry coke and at $6 for the beehive product. Less than 100 beehive ovens are operating, but all except 30 of the by-product coke ovens of the district are producing. The threatened strike at union coal mines in Illinois, Indiana, Ohio and Pennsylvania is bringing out an increasing demand for fuel.

Old Material.—Heavy melting steel and No. 1 cast are the principal grades in demand, and recent sales call for large amounts of those products. Dealers are experiencing no trouble in getting all the scrap they can use, and full yard forces are being employed in preparing the material according to specifications in effect in this district.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Cast iron borings, chemical	$15.50 to $16.00
Heavy melting steel	12.00 to 12.25
Railroad wrought	11.00 to 12.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
Steel rails	12.50 to 13.00
No. 1 cast	15.00 to 16.00
Tramcar wheels	15.00 to 16.00
Carwheels	14.00 to 15.00
Stove plate	13.00 to 14.00
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Rails for rolling	15.00 to 16.00

St. Louis

Further Declines in Scrap—Freer Steel Specifications—Pig Iron Dull

ST. LOUIS, March 1.—Pig iron buying continues light, and sales for the week, totaling less than 2000 tons and consisting of small lots for prompt shipment or the remainder of first quarter, were the lowest in many weeks. Foundries are booking much less business from railroad and other interests than had been expected, and their purchases of raw material are correspondingly smaller. Their stocks likewise are low. The Federal Reserve Bank of St. Louis reports that operations at jobbing foundries in February averaged only 60 per cent of capacity while steel mills ran at slightly below 70 per cent, as compared with the previous month. Sales of implement makers, the same report states, have picked up considerably since the first week in February.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, $2.16 freight from Chicago, $4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$22.66
Northern malleable, sil. 1.75 to 2.25	22.66
Basic	22.66
Southern fdy., sil. 1.75 to 2.25	$22.42 to 23.42
Granite City iron, sil. 1.75 to 2.25	21.81 to 22.31

Coke.—Consumers of industrial grades of coke are reported to be buying to increase their storage holdings in anticipation of a coal strike in April. Inquiries are heavier, and there has been a good movement from ovens in the district. Prices are unchanged.

Finished Iron and Steel.—A slight improvement in the demand for plates and shapes is reported, as well as heavier specifications against contracts. Warehouse business as a whole has fallen off somewhat, as compared with a month ago, although it is about on a par with the volume a year ago. Business is extremely quiet in structural lines in St. Louis, and fabricators are eager for business. Buying by the railroads is at a low ebb.

Old Material.—An East Side steel mill bought 1500 to 2000 tons of melting rails and specialties from four or five dealers at less than prevailing prices, with the result that the dealers made corresponding reductions in their quotations to consumers. It is understood that dealers accepted no more business in the items wanted than was represented by material either on hand or purchased, and that they sustained a loss on the orders. The material is for delivery within the next 30 days. No other business is in prospect. Railroad lists include: Pennsylvania, 40,300 tons; Chicago, Milwaukee & St. Paul, 5000 tons; Missouri Pacific, 7500 tons; Big Four, 4450 tons, and Louisville & Nashville, 1300 tons of relaying rails.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$14.00 to $14.50
Rails for rolling	14.50 to 15.00
Steel rails less than 3 ft.	16.00 to 16.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00
Cast iron carwheels	14.25 to 14.75
Heavy melting steel	12.25 to 12.75
Heavy shoveling steel	12.25 to 12.75
Frogs, switches and guards cut apart	13.00 to 13.50
Railroad springs	14.50 to 15.00
Heavy axle and tire turnings	9.75 to 10.25
No. 1 locomotive tires	16.75 to 17.25
Per Net Ton	
Steel angle bars	17.00 to 17.50
Steel car axles	17.25 to 17.75
Iron car axles	20.50 to 21.00
Wrought iron bars and transoms	17.50 to 18.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	11.00 to 11.50
Cast iron borings	8.75 to 9.25
No. 1 busheling	9.75 to 10.25
No. 1 railroad cast	14.25 to 14.75
No. 1 machinery cast	16.00 to 16.50
Railroad malleable	12.00 to 12.50
Machine shop turnings	6.25 to 6.75
Bundled sheets	7.50 to 8.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, mild steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 24 black sheets	4.45c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	5.25c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.65c.
Boiler rivets	3.85c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47½
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

Youngstown

Coal Strike Looming as a Factor and Operations Well Sustained

YOUNGSTOWN, March 1.—The possibility of a coal miners' strike one month hence looms as perhaps the most important influence affecting the iron and steel situation at this time. One major independent interest has declined to open its books for second quarter as yet, because of the uncertainties arising from the probable strike development. In the meantime, producers have amply fortified themselves in building up coal reserves, supplies ranging from 60 to 90 days' requirements. There is a feeling in well-informed quarters that the strike, if it materializes, may last four to five months or longer, bringing attendant disorders to industries dependent upon coal for their operation.

While the coal mines operated by some of the steel

companies in the Youngstown district are on an open shop basis, it is expected they will suspend production in event of a general strike among the miners.

Companies without adequate coal storage facilities are encountering the usual difficulties in handling extra large supplies, owing to their lack of such storage accommodation. One large interest, with unusually heavy supplies, reports that a number of fires have broken out in its coal piles, causing considerable loss before they were extinguished. Due to exposure to the elements, there is also appreciable depreciation in heat values.

Steel production in this area continues at an 80 per cent average, with 42 of 53 independent open-hearth furnaces melting and 113 of 127 Valley sheet mills under power. During February, the Youngstown Sheet & Tube Co. blew out two blast furnaces in its Eastern division, and expected partly to offset this iron loss by the resumption of a stack in its Brier Hill group. The resumption of this furnace has been delayed, however, because of the anticipated coal strike.

Plans for 240-Ton Open-Hearth Furnaces

In planning the enlargement of its open-hearth steel plant, the Trumbull Steel Co., Warren, is considering installation of two 240-ton open-hearth furnaces, instead of four 100-ton furnaces, as originally planned. It is claimed the larger types are more economical in operation. Upon the completion in May of a wide strip mill unit, now being installed, the Trumbull company expects to increase its monthly production of rolled steel to 60,000 tons, against an average of 40,000 tons produced per month in 1926. This expansion will also involve increased steel supply. The Trumbull company now has eight open-hearth furnaces, with a yearly capacity for producing 650,000 tons of ingots, which it is planned to increase to 1,000,000 tons. An eighth open-hearth furnace was added about two years ago and at that time foundations were laid for a ninth unit.

The leading independent interest reports that while production and shipments for January and February are running ahead of the last quarter of 1926, they are below the figures for the first two months of last year.

Merchant bar mills at Youngstown are active at a 65 per cent rate. The Newton Steel Co. has moved to a capacity basis, operating all of its 20 mills at Newton Falls in Trumbull county.

Toronto

Scrap Prices Decline—Pig Iron Buying Confined to Small Lots

TORONTO, ONT., March 1.—Generally speaking, interest in the Canadian pig iron market is lagging. The bulk of current business is confined to lots ranging from 50 to 200 tons for spot delivery. Buying for second quarter is not active, and in most cases blast furnace representatives do not appear to be pushing sales. Canadian pig iron prices are firm as follows:

	Per Gross Ton
Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$24.80
No. 2 foundry, sil. 1.75 to 2.25	24.30
Malleable	24.80
Montreal	
No. 1 foundry, sil. 2.25 to 2.75	27.00
No. 2 foundry, sil. 1.75 to 2.25	26.50
Malleable	27.00

Old Material.—Contrary to predictions made earlier in the year iron and steel scrap prices have fallen into a slump, with reductions of from 50c. to $2 per ton reported. Steel turnings, heavy axle turnings and heavy melting steel each dropped 50c. per gross ton; and machine shop turnings declined from $8.50 to $7 per gross ton. The price offered by dealers for boiler plate is down from $10 to $8 per gross ton, and standard carwheels were reduced $1 per net ton, with dealers now offering $14 for that commodity. In the Montreal district, dealers' buying prices show reductions of 50c. per gross ton on heavy melting steel and boiler plate. The current demand for old material is practically at a standstill. Those consumers who have contracted for this quarter's needs are ordering against contract, which results in a steady movement of material. New business, however, is dull and confined to small tonnages for the immediate needs of consumers. No future buying has been reported during the week. Price reductions were the direct result of the stagnant state of the market, together with lower quotations on pig iron and the softening tendency that has affected scrap prices in the United States of late.

Dealers' buying prices are as follows:

	Toronto	Montreal
Per Gross Ton		
Steel turnings	$8.00	$8.00
Machine shop turnings	7.00	7.50
Wrought pipe	6.00	6.00
Rails	11.00	10.00
No. 1 wrought	11.00	14.00
Heavy melting steel	10.50	9.00
Steel axles	16.00	17.00
Axles, wrought iron	18.00	19.00
Boiler plate	8.00	8.00
Heavy axle turnings	8.50	8.50
Cast borings	8.50	7.50
Per Net Ton		
Standard carwheels	14.00	16.00
Malleable scrap	14.00	14.00
Stove plate	10.00	13.00
No. 1 machinery cast	16.00	18.00

Cincinnati

Southern Stove Makers Buy Sheets—Foundry Coke Down 50c

CINCINNATI, March 1.—Pig iron buying for second quarter delivery has increased substantially, although formal inquiries before the trade are light. Northern Ohio furnaces are reported to have increased their prices 50c. to $1 a ton in this territory, but they continue to book the major tonnages sold in western Ohio and in Indiana. The Link-Belt Co. has purchased about 3000 tons of malleable for its Indianapolis plant, while the Lavelle Foundry Co., Anderson, Ind., has contracted for 1500 to 2000 tons of Northern foundry. The bulk of the iron for both of these companies will be supplied by Lake Erie producers.

The report that the Andrews Steel Co., Newport, Ky., is in the market for 30,000 to 40,000 tons of basic is erroneous, officers of the company emphatically denying that the purchase of iron is contemplated. Southern Ohio furnace interests have booked only a few small lots of iron, and whether they would quote as low as $19, base furnace, on a sizable inquiry is not known. Southern iron remains at $18, base furnace, but sales north of the Ohio River have been meager.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$21.69
Alabama fdy., sil. 2.25 to 2.75	22.19
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25	20.89
So. Ohio malleable	$20.64 to 21.89

Finished Material.—As a result of an upward trend in specifications and orders during the past two weeks, February has turned out to be a fairly good month

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 24 black sheets	4.05c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	4.90c.
Structural rivets	3.75c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100 lb. keg	3.15
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

from a sales standpoint, and business is expected to expand considerably during March. There have been no further recessions in prices, and there is a gradual improvement of the demand from many consuming industries. Stove manufacturers in the South have purchased sheets to fill their requirements over the next four to six weeks, and inquiries for galvanized sheets from the roofing trade are looked upon as forecasting good buying in March and April. Agricultural implement manufacturers have been specifying against contracts at a fairly satisfactory rate. Production of sheets is going ahead on a full schedule. One company in this district is operating all of its mills at capacity, and another concern is on a basis close to 90 per cent. Orders from automobile makers in the Detroit district are responsible in large part for the heavy operating programs of producers in this territory. Electrical sheets, which have been quiet, are moving in better volume. Quotations on galvanized sheets run from 3.65c. to 3.75c., base Pittsburgh, with several Eastern makers holding to the latter figure. Black sheets are selling at 2.80c. to 2.90c., base Pittsburgh, and blue annealed at 2.20c., base Pittsburgh. Bar bookings at 1.90c., base Pittsburgh, have been moderate. Common wire nails are being delivered to local warehouses by an Ironton, Ohio, producer at $2.72 per keg, and at least one Eastern seller is understood to be meeting that price. Other mills are adhering to $2.55, base Pittsburgh. Sales of cold-rolled steel have improved considerably in the past few weeks.

Reinforcing Bars.—Sales are confined to small tonnages, and no jobs of consequence are before the trade. Meanwhile new billet bars nominally are quoted at 1.90c., base Pittsburgh, and rail steel bars at 1.80c., base mill.

Warehouse Business.—The ability of mills to make prompt delivery on practically all products has had a depressing effect upon the jobbing business, with the result that the volume of sales in February was somewhat light. Demand for plates has been good, and orders from machine tool builders for cold-rolled steel have held up fairly well. Prices are steady and unchanged.

Old Material.—The Portsmouth, Ohio, works of the Wheeling Steel Corporation has purchased a round tonnage of heavy melting steel at a delivered price of $15.15, a reduction of 50c. a ton from the previous level. Mills in this district are operating at a high rate and therefore are accepting a liberal amount of material on contract. Dealers' buying prices are the same as a week ago. The Big Four has a list of about 4000 tons closing today.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

	Per Gross Ton
Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	12.50 to 13.00
Short rails	17.50 to 18.00
Relaying rails	26.50 to 27.00
Rails for rolling	14.00 to 14.50
Old carwheels	12.00 to 12.50
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	14.50 to 15.00
Agricultural malleable	13.50 to 14.00
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	9.50 to 10.00
Per Net Ton	
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	16.00 to 17.00
No. 1 railroad cast	13.00 to 13.50
Iron axles	19.50 to 20.00
No. 1 railroad wrought	9.00 to 9.50
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Mixed busheling	6.00 to 6.50
Burnt cast	7.00 to 7.50
Stove plate	9.00 to 9.50
Brake shoes	9.50 to 10.00

Coke.—The Ashland By-Product Coke Co., Ashland, Ky., and the Citizens Gas Co., Indianapolis, have reduced by-product foundry coke 50c. a ton to $7.50 per net ton, f.o.b. ovens, thereby meeting the quotations of the Portsmouth By-Product Coke Co. Domestic grades, however, remain unchanged, No. 2 nut bringing $5.50 at ovens, and egg and walnut, $6. In Michigan, by-product foundry continues at $10.50, Detroit ovens, for outside delivery and at $11.25, delivered, in Detroit. By-product coke companies are now in the midst of their annual campaign to secure contracts for the year beginning April 1. Competition between sellers during this drive has brought out a price of $5, ovens, on approximately 6000 tons for the Kokomo Steel & Wire Co., Kokomo, Ind., that figure to apply on the year's specifications. Consumers in this territory are guarding against the exigencies of a coal strike and are stocking beehive coke in ample quantities, New River foundry grades are firm at $7.50, ovens, and foundry coke from the Wise County district is selling at $5 to $5.50, ovens. Wise County furnace coke is quoted at $4.25 to $4.50, ovens, although one producer has sold 500 tons to a large local company at $3.75.

Based on freight rates of $2.14 from Ashland, Ky., and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Wise County foundry, $7.59 to $8.09; New River foundry, $10.09 to $10.59; by-product foundry, $9.52 to $9.64.

Boston

Pig Iron Market Still Active—Foundries Stock Coke

BOSTON, March 1.—Pig iron buying in New England during the last week in February was heavier than generally anticipated. It embraced the rounding out of purchases by the H. B. Smith Co., Westfield, Mass.; one 2000-ton and four 1000-ton lots of No. 2X and No. 1X; and numerous lots ranging from 600 tons down to carloads. Aside from the H. B. Smith Co. purchase little No. 2 plain iron was involved, and Buffalo and east-of-Buffalo furnaces took most of the business. Sales of these irons were made on a delivered basis equivalent to $16.50 a ton, base Buffalo, and a Virginia furnace in the process of liquidation made some exceptionally low quotations. During the past few days prices have been firmer. Two Buffalo district steel mills have advanced $1 to $18, base, making three companies now quoting that price. Furnaces east of Buffalo are said to be following the Buffalo price trend.

We quote delivered prices per gross ton to most New England points as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $6.91 to $6.77 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.15 to $24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Buffalo, sil. 1.75 to 2.25	21.91 to 22.91
Buffalo, sil. 2.25 to 2.75	21.91 to 22.91
Virginia, sil. 1.75 to 2.25	26.92 to 27.42
Virginia, sil. 2.25 to 2.75	27.42 to 27.92
Alabama, sil. 1.75 to 2.25	24.91 to 26.77
Alabama, sil. 2.25 to 2.75	25.41 to 27.27

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. announce that by-product foundry coke on contracts for March will be $12.50 a ton delivered, within a freight rate zone of $3.10. That price is the same as made by these ovens in February. During the last week or 10 days foundries have specified rather freely against first half contracts for deliveries in March. With the possibility of a coal strike a month ahead, foundries are stocking up with coke as a precautionary measure.

Cast Iron Pipe.—Lynn, Mass., has awarded 250 tons of 6-in. and 8-in. pipe to the Warren Foundry & Pipe

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Plates	3.365c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Co., the second lowest bidder. That foundry also has taken 500 tons for Meriden, Conn., and an unspecified tonnage covering this year's requirements for Melrose, Mass. Worcester, Mass., has bought 1000 tons of 6-in. and larger pipe from R. D. Wood & Co., and it is reported that the United States Cast Iron Pipe & Foundry Co. has taken 700 tons of pipe from Springfield, Mass. Bids close Thursday, March 3, for approximately 100 tons of 6-in. pipe wanted by Brockton, Mass. Prices quoted openly on domestic pipe are: 4-in., $58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $53.10 to $54.10; larger pipe, $52.10 to $53.10. A $5 differential is asked on Class A and gas pipe.

Finished Material.—Although not actually higher, prices for standard shapes and bars appear firmer at 1.90c. per lb., base Pittsburgh. Specifications against old contracts are a little freer than heretofore, but new business is coming in slowly. The market for plates is quiet and barely steady at 1.90c. per lb., base Pittsburgh. Reinforcing bars are moving in limited quantities, with prices steady at 1.90c., base.

Imports.—During February 12,350 tons of Dutch pig iron was received at this port. In January, this year, no pig iron was received at Boston, while in February, last year, 4061 tons was received and in January, two years ago, 8212 tons. The Mystic Iron Works in February received 6600 tons of Ouenza ore, contrasted with 16,052 tons of ore in January.

Old Material.—Steel turnings are now generally $6 to $6.50 a ton, on cars shipping point, 50c. a ton less than a week ago, and the market for mixed borings and turnings also is easier. Prices otherwise show little variation. The market for blast furnace borings and turnings is a little more active, owing to purchases against an eastern Pennsylvania steel mill's order, and the movement of heavy melting steel out of New England is a little freer. The market for old material in general, however, remains quiet, with buyer's and seller's ideas of prices still far apart.

The following prices are for gross-ton lots, delivered at consuming points:

Textile cast	$18.00 to $18.50
No. 1 machinery cast	17.00 to 17.50
No. 2 machinery cast	15.50 to 16.00
Stove plate	13.00 to 13.25
Railroad malleable	16.50 to 17.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.50 to $10.00
No. 1 railroad wrought	12.00 to 12.25
No. 1 yard wrought	11.00 to 11.25
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.50 to 9.00
Machine shop turnings	6.00 to 6.50
Cast iron borings, chemical	10.00 to 10.50
Cast iron borings, rolling mill	7.50 to 8.00
Blast furnace borings and turnings	5.75 to 6.00
Forged scrap	7.50 to 8.00
Bundled skeleton, long	7.60 to 8.00
Forged flashings	7.50 to 8.00
Shafting	15.00 to 15.50
Street car axles	15.50 to 16.00
Rails for rerolling	11.00 to 11.50
Scrap rails	9.50 to 10.00

Buffalo

Pig Iron Demand Tapers—Mill Operations Show Further Improvement

BUFFALO, March 1.—The pig iron market is quiet, most of first half requirements of melters having been satisfied in the recent buying wave. The Westinghouse Electric & Mfg. Co., has put out an inquiry for 2000 tons of foundry, and the Worthington Pump & Machinery Corporation wants 700 tons for its Buffalo plant. The aggregate of other inquiry is small. Furnaces are quoting $17.50 to $18, Buffalo, on business in this district, while $17, Buffalo, has been done on Eastern business. Two producers are holding to $18, base, on district business and are adhering strictly to the silicon differentials.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00 to $18.00
No. 2X foundry, sil. 2.25 to 2.75	17.00 to 18.50
No. 1X foundry, sil. 2.75 to 3.25	18.00 to 19.50
Malleable, sil. up to 2.25	17.00 to 18.00
Basic	17.00 to 18.00
Lake Superior charcoal	27.28

Finished Material.—Demand for all rolled products has improved in the past two weeks, and mills report good business. Bars are strong at 2.165c., Buffalo, for sizable lots and at 2.265c. for small lots. The same prices prevail on shapes, with demand good. There is more activity in the structural fabricating field and awards are being made with dispatch, indicating that builders are desirous of taking advantage of the price situation. The National Biscuit Co. plant to be erected in Buffalo, as previously mentioned in these columns, will probably require 1500 tons of structural steel instead of 500 as first estimated.

Old Material.—The market is sentimentally stronger because consumption at the mills is steadily increasing. Dealers who have old orders are finding it difficult to get material at the prices paid by the mills. Inspection is rigid, and one mill has changed its specifications. Small sales of malleable and No. 1 cast have been made. Some sales of specialties, angle bars and short rails have been closed at around $17.50.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$14.50 to $15.00
Selected No. 1 heavy melting steel	15.50 to 16.00
Low phosphorus	17.50 to 18.00
No. 1 railroad wrought	13.00 to 13.50
Carwheels	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.50 to 12.00
No. 1 busheling	14.00 to 14.50
Stove plate	14.50 to 14.75
Grate bars	12.00 to 13.00
Hand bundled sheets	10.50 to 11.50
Hydraulic compressed sheets	14.00 to 14.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.00 to 13.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 24 black sheets	4.30c.
No. 10 blue annealed sheets	3.80c.
No. 24 galvanized sheets	5.15c.
Common wire nails, base per keg	$3.90
Black wire, base per 100 lb.	3.90

Heavier Scrap Offerings at Detroit

DETROIT, March 1.—Tonnages of waste material offered by the largest producers in the district for March delivery are as heavy as for any single month's offering for the past year. This is due, no doubt, to increased automobile schedules for March in anticipation of May sales. In spite of the large tonnage the market shows no signs of weakness, but rather has a firm tendency.

Heavy melting and shoveling steel	$13.00 to $13.50
Borings and short turnings	8.50 to 9.00
Long turnings	7.50 to 8.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	17.50 to 18.00
Hydraulic compressed	11.25 to 11.75
Stove plate	13.50 to 14.50
No. 1 busheling	11.00 to 11.50
Sheet clippings	8.25 to 8.75
Flashings	11.25 to 11.75

The Oliver Machinery Co., Grand Rapids, Mich., has been appointed exclusive agent and distributer in the United States for the Semi-Auto wood miller manufactured by Wadkin & Co., Leicester, England. These machines were sold by the Oliver company before the war. They have since been redesigned, one of the improved models having been exhibited during the convention of the American Foundrymen's Association in Detroit, Sept. 27-Oct. 1, 1926. The Oliver company will carry a stock of the Wadkin machines, cutters and fittings.

FABRICATED STRUCTURAL STEEL

Large Total of Awards—Office Building in New York Takes 25,000 Tons

An office building in New York taking 25,000 tons of steel makes up nearly one-third of the week's total of about 70,000 tons of structural steel awards. A New York church will require 7300 tons, and there are a number of other sizable awards. New inquiries total only 13 500 tons, but a good deal of work recently reported in these columns is still pending. Awards follow:

NEWBURYPORT, MASS., 300 tons for bridge repairs, to Boston Bridge Works, Inc.

CAMBRIDGE, MASS., 300 tons, Central Square Trust Co. building, to Lehigh Structural Steel Co.

CAMBRIDGE, 155 tons, garage for baking company, to an unnamed fabricator.

SALEM, MASS., 100 tons, hospital, to Lehigh Structural Steel Co.

LEXINGTON, MASS., 150 tons, memorial building, to New England Structural Co.

MEDFORD, MASS., 164 tons, mercantile building, to New England Structural Co.

BRISTOL, CONN., 130 tons, theater for Colonial Theaters, Inc., to New England Structural Co.

DEVON, CONN., 200 tons, building for Connecticut Light & Power Co., to McClintic-Marshall Co.

NEW YORK, 25,000 tons, office building, New York Central Railroad, Park Avenue, Forty-fifth and Forty-sixth Streets, to McClintic-Marshall Co.

NEW YORK, 7300 tons, Park Avenue Baptist Church, Riverside Drive and 122nd Street, to Taylor-Fichter Steel Construction Co.

NEW YORK, 3600 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: 30-story office building, Fifth Avenue and Forty-seventh Street; theater and office building, Jamaica; poultry terminal building, 1 East 149th Street, and sanitarium, 183rd Street and Loring Place, to George A. Just Co.

NEW YORK, 1000 tons, apartment building, to Post & McCord.

NEW YORK, 750 tons, Campanile apartment building on East Fifty-second Street, to Hay Foundry & Iron Works.

NEW YORK, 3500 tons, apartment hotel on West Forty-sixth Street, to Harris Structural Steel Co.

NEW YORK, 1100 tons, Friedenberg loft building at 264-268 West Fortieth Street, to Harris Structural Steel Co.

NEW YORK, 400 tons, warehouse for Richard Deeves & Son, to an unnamed fabricator.

EPHRATA, PA., 300 tons, mill building for Stunze Silk Co., to McClintic-Marshall Co.

MONTOURSVILLE, PA., 450 tons, bridge for Reading Railroad, to McClintic-Marshall Co.

MIAMI, FLA., 1200 tons, causeway; 1000 tons for viaduct portion, to Lehigh Structural Steel Co., and 200 tons for lift spans, to Nashville Bridge Co.

LOUISVILLE & NASHVILLE RAILROAD, 4000 tons, bridge in Alabama, to McClintic-Marshall Co.

ASHLAND, KY., 2700 tons, plant extension for American Rolling Mill Co., to Fort Pitt Bridge Works.

PITTSBURGH, 120 tons, McSorley apartment building, to Guibert Steel Co., Pittsburgh.

ZANESVILLE, OHIO, 500 tons, American Rolling Mill Co. plant extension, to Fort Pitt Bridge Works.

INDIANAPOLIS, 250 tons, Shortridge Hotel, to Indiana Bridge Co.

CHICAGO, 125 tons, buildings in Gage Park, to New City Iron Works, Chicago.

CHICAGO, 3400 tons, Cook County jail, to McClintic-Marshall Co.

CHICAGO, BURLINGTON & QUINCY RAILROAD, 900 tons, bridges, to American Bridge Co. and Omaha Bridge Co.

STATE OF WISCONSIN, 310 tons, 6 State highway bridges, to unnamed bidder.

VANCOUVER, B. C., 800 tons, bridge over South Thompson River at Kamloops, B. C., for the Canadian National Railways, to an unnamed fabricator.

SEATTLE, WASH., 172 tons, Rhodes department store, to Wallace Bridge & Structural Steel Co.

PORTLAND, ORE., 600 tons, building for the Portland Gas & Coke Co., to Poole & McGonigle, Portland.

PORTLAND, 275 tons, warehouse for Libby, McNeill & Libby, to Poole & McGonigle.

OAKLAND, CAL., 1400 tons, La Casa Grande apartments, Euclid and Grand Avenues, to Pacific Coast Engineering Co., Oakland.

SAN JOSE, CAL., 400 tons, Medico-Dental Building, to Dyer Brothers, San Francisco.

SAN FRANCISCO, 150 tons, apartment building on Hay Street, to Dyer Brothers.

SAN FRANCISCO, 800 tons, plates for boiler work for the Southern Pacific Co., to an Eastern mill.

LOS ANGELES, 400 tons, transmission towers for the city, to Pacific Coast Steel Co.

LOS ANGELES, 2300 tons, club building, to Union Iron Works.

HONOLULU, 135 tons, sugar mill on the Hutchinson plantation, to an unnamed fabricator.

HONOLULU, 250 tons, Honolulu Stadium, to Honolulu Iron Works.

ROCHESTER, N. Y., 195 tons, building for Consolidated Machine Tool Corporation, to McClintic-Marshall Co.

ROCHESTER, 900 tons, factory for Stromberg-Carlson Mfg. Co., to Genesee Bridge Co.

CHICAGO, 3500 tons, Mercantile Exchange Building, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 480 tons, mezzanine floors; W. F. Schafft & Sons Corporation.

MILFORD, MASS., 200 tons, theater.

NEW YORK, 700 tons, route 78, section 6C of New York subways; bids close March 4.

NEW YORK, 450 tons, garage in Bronx borough.

NEW YORK, 1800 tons, building for Central Savings Bank at Broadway and Seventy-third Street.

NEW YORK, 500 tons, elevated roadway over Depew Place, east of Grand Central Terminal.

BROOKLYN, 350 tons, recreation pier at Atlantic Avenue.

ELIZABETH, N. J., 700 tons, building for Lidgerwood Mfg. Co.

CAMDEN, N. J., 300 tons, store building.

BRIGANTINE BEACH, N. J., 300 tons, golf club building.

MIDDLETOWN, N. Y., 250 tons, Memorial Hospital.

CLEVELAND, 2000 tons, clubhouse for the Cleveland Club.

OAKLAND, CAL., 1500 tons, 48-in. to 56-in. pipe line for East Bay Municipal Utility District; bids to be called soon.

OAKLAND, 275 tons, Elmhurst Telephone Exchange; bids postponed for about one month.

SAN FRANCISCO, 300 tons, Arena de Plaza.

PORTLAND, ORE., tonnage unstated, plate work for the Union Oil Co.; bids to be called soon.

PORTLAND, 1600 tons for a warehouse.

KAIMUKI, T. H., tonnage unstated, pumping station; bids to be called soon.

BURLINGTON, N. J., 500 tons, bascule bridge to be built by Burlington County.

CAMDEN, N. J., 175 tons, three State highway bridges.

WATSONTOWN, PA., 1400 tons, highway bridge to be built by Northumberland County.

LLEWELLYN, PA., 300 tons, Reading Railroad bridge.

New Trade Publications

Forging Hammers.—Nazel Engineering & Machine Works, 4045 North Fifth Street, Philadelphia. Bulletin, entitled "Cutting Forging Costs" which shows company's hammer at work in various lines of industry. Also the Nazel Hammer Book, dealing with air driven forging hammers, and the Neilson Performance Surveys, presenting statistics on the use of these tools.

Speed Reducers.—Boston Gear Works, Inc., Norfolk Downs, Mass. Booklet dealing with standardized speed reducers from 1 to 25 hp., and up to a 400 to 1 ratio. Specifications are included and various descriptive details.

Electrical Appliances.—Benjamin Electric Mfg. Co. Chicago. *Benjamin Reflector*, recently established as a house organ of the company. Of particular interest is a description of the Crysteel refrigerator cabinet for mechanical refrigeration.

Centrifugal Air Compressors.—General Electric Co., Schenectady, N. Y. GEA-528 listing typical installations, applications, construction details and operating characteristics of the company's small, multi-stage centrifugal air compressor.

Check Valves.—Smolensky Valve Co., Inc., Cleveland. Leaflet illustrating installations of the company's noiseless flanged check valves on various types of centrifugal pumps. Bulletin 2, providing details of construction of the same products with a number of charts and diagrams.

Compensators.—General Electric Co., Schenectady, N. Y. GEA-570 devoted to the company's hand starting compensators of the dead front cabinet type for use on two- and three-phase squirrel cage induction motors.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Mar. 1	Feb. 28	Feb. 26	Feb. 25	Feb. 24	Feb. 23
Lake copper, New York	13.50	13.50	13.37½	13.37½	13.25	13.25
Electrolytic copper, N. Y.*	13.12½	13.00	13.00	13.00	12.87½	12.87½
Straits tin, spot, New York	69.62½	70.50	....	70.95	70.37½	69.75
Lead, New York	7.40	7.40	7.40	7.40	7.40	7.40
Lead, St. Louis	7.32½	7.32½	7.30	7.30	7.30	7.30
Zinc, New York	7.17½	7.22½	7.20	7.20	7.17½	7.17½
Zinc, St. Louis	6.82½	6.87½	6.85	6.85	6.82½	6.82½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, March 1.—Activity in the markets continues only moderate. Prices of copper have advanced quite steadily, but domestic buying has been light. The high level of tin prices has continued with sales in fair volume. Very little changes in prices or activity are noted in the lead market. The zinc market has continued firm with demand moderate.

Copper.—There has been a steady increase in prices the last week, due more to foreign buying than to demand from domestic consumers. Purchases from abroad have been quite general with England and Germany the leaders. This condition has been the mainspring in the strength here and is reflected in the several advances made by Copper Exporters, Inc., the last being effective today, at 13.65c., c.i.f. Hamburg. A week ago this price was 13.37½c. Electrolytic copper was sold in a limited way yesterday at 13.25c., delivered, but today the market is firm at 13.37½c., delivered. Lake copper is quoted at 13.50c., delivered.

Copper Averages.—The average price of Lake copper for the month of February, based on daily quotations in THE IRON AGE, was 13.08½c. The average price of electrolytic copper was 12.69c., refinery, or 12.94c., delivered.

Tin.—Sales the past week were fairly large, considering the holiday on Feb. 22, the total being estimated at 1100 to 1200 tons. Dealers were the principal buyers, taking about two-thirds of the total. Deliveries into American consumption during February were 5965 tons and were smaller than expected, due partly to slow discharge of the metal from steamers. Tin in stock and landing on Feb. 28 was 2484 tons, of which 1905 tons was landing, being correspondingly large. Data as to the world's visible supplies are not yet available, but estimates in London placed the decrease from 1125 to 1220 tons for the month. Shipments from the Straits for the month are estimated at 4300 tons, a low total. These facts explain in part the high prices prevailing lately. In London today there was a decided break in prices, due to the large estimates of March shipments from the Straits, running as high as 7200 to 7250 tons. Quotations there today were: Spot standard, £311 5s.; future standard, £299 and spot Straits, £323 5s. The Singapore price today was £316 10s. The total arrivals for February were 5145 tons and the quantity afloat at the end of the month was 4940 tons. Spot Straits tin today was quoted at 69.62½c., New York. A fair business was done in April delivery at 69.12½c. with some for March at 69c.

Lead.—There have been no features, but demand has been fairly good with some inquiry for April delivery. The leading interest continues to take business at its contract price at 7.40c., New York, which has been maintained for some time. In the outside market prices are a little stiffer at 7.32½c. to 7.35c., St. Louis.

Zinc.—There has been a fairly heavy demand for zinc for some weeks and large bookings have been conducted quietly. There has been very little change in prices the past week with prime Western quoted nominally yesterday at 6.87½c., St. Louis, and some sales made at 6.85c. Today, however, the situation is a little easier and the quotation is 6.82½c., St. Louis. Ore prices were advanced another dollar per ton this week to $45. Producers continue the policy of not pressing the market.

Antimony.—Due partly to somewhat aggressive

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig	72.50c. to 73.50c.
Tin, bar	74.50c. to 75.50c.
Copper, Lake	14.62½c.
Copper, electrolytic	14.37½c.
Copper, casting	13.87½c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	8.25c. to 8.75c.
Lead, bar	10.75c. to 11.25c.
Antimony, Asiatic	15.75c. to 16.25c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	29.00c. to 30.00c.
Babbitt metal, commercial grade	30 00c. to 40.00c.
Solder, ½ and ½	43.00c. to 44.00c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	76.50c.
Tin, bar	78.50c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc, slab	8.25c.
Lead, American pig	8.25c.
Antimony, Asiatic	20.50c.
Lead, bar	10.00c.
Babbitt metal, medium grade	20.75c.
Babbitt metal, high grade	79.75c.
Solder, ½ and ½	44.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	18.37½c. to 19.12½c.
Copper, hot rolled	22.00c. to 23.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c. to 25.25c.
Seamless Tubes—	
Brass	23.25c. to 24.25c.
Copper	24.00c. to 25.00c.
Brazed Brass Tubes	26.12½c. to 27.12½c.
Brass Rods	15.87½c. to 16.87½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	12.75c. to 13.00c.
Zinc sheets, open	13.25c. to 13.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were advanced ¼c. on Feb. 28. Zinc sheets and lead full sheets have not changed since Jan. 10 and 24, respectively.

List Prices per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.37½c.
Copper, hot rolled	22.00c.
Zinc	11.00c.
Lead (full sheets)	11.00c. to 11.25c.
Seamless Tubes—	
High brass	23.25c.
Copper	24.00c.
Rods—	
High brass	16.12½c.
Naval brass	18.87½c.
Wire—	
Copper	15.37½c.
High brass	18.87½c.
Copper in Rolls	20.87½c.
Brazed Brass Tubing	26.37½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18½c.
Copper, hot rolled	21.75c.
Copper, cold rolled, 14 oz. and heavier	24.00c.
Zinc	12.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	23.00c.
Copper	23.75c.
Brazed Brass Tubes	26½c.
Brass Rods	15⅞c.

selling by one or two importers, prices were easier with Chinese metal quoted at 13.50c., New York, duty paid, for spot and 13c. for futures.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

MARCH 1.—This market is showing greater activity and prices have advanced. Old metals are sluggish and quotations are nominal.

We quote in carload lots: Lake copper, 13.50c.; tin, 72.50c.; lead, 7.40c.; zinc, 6.90c.; in less than carload lots, antimony, 15.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 6.25c.; zinc, 4.25c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 15c.; all being dealers' prices for less than carload lots.

Philadelphia Iron and Steel Market

(Concluded from page 677)

this year. Some of this business was for shipment this month, but a good deal of it will run over into second quarter. Sheet prices are steadier, but are no higher. Black sheets range from 2.75c. to 2.80c., Pittsburgh; galvanized from 3.60c. to 3.70c., and blue annealed are being more closely held at 2.20c., although an occasional quotation of 2.15c. is being made.

Imports.—Last week's receipts of steel and allied products from abroad were as follows: Manganese ore from British East Africa, 1500 tons; chrome ore from Portuguese East Africa, 5350 tons; ferrosilicon from Germany, 100 tons; steel angles from the Netherlands, 10 tons; steel bars from the Netherlands, 31 tons; structural steel from Belgium, 145 tons; steel bands from Belgium, 35 tons; steel tubes from Belgium, 5 tons.

Puddling Wage Rate Reduced

YOUNGSTOWN, March 1.—Puddlers' tonnage rates decline 25c. per ton to $11.13 for March and April, and finishers are reduced 2½ per cent, following the bimonthly settlement today. Examination of sales sheets revealed a decline of $1 per ton on bar iron, on shipments for 60 days ended Feb. 28, as compared with average price on shipments for the preceding 60-day period. The average today was disclosed at 1.95c. per lb., against average of 2c. two months ago.

Pig Iron Rates Upheld

WASHINGTON, March 1.—The rate of $2.90 per ton on pig iron from Indiana Harbor, Ind., and South Chicago, Ill., to Holland, Mich., and the rate of $3.65 per ton on pig iron from Port Henry, N. Y., to Waterbury, Conn., are not unreasonable, according to proposed reports announced today by the Interstate Commerce Commission.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.25c.	12.75c.
Copper, heavy and wire	11.00c.	12.00c.
Copper, light and bottoms	9.25c.	11.00c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	8.50c.	10.00c.
No. 1 yellow brass turnings	7.75c.	8.625c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	6.25c.	6.75c.
Lead, tea	4.25c.	5.00c.
Zinc	3.75c.	4.25c.
Sheet aluminum	15.00c.	17.00c.
Cast aluminum	15.00c.	17.00c.

RAILROAD EQUIPMENT

Week's Orders Total About 2100 Cars—Several Orders for Repair Parts

Several orders from railroads and a coal company make a total of about 2100 freight cars bought within the week. Railroads have also been buying underframes and superstructures in a way to indicate that considerable repair work is to be undertaken in railroad companies' own shops. The Norfolk & Western is inquiring for 1000 steel car bodies.

The New York, New Haven & Hartford has ordered 10 locomotives from the American Locomotive Co.

The Chicago, Burlington & Quincy has ordered 301 ballast cars from the Rodger Ballast Car Co., which will be built in the shops of the American Car & Foundry Co.

The Bangor & Aroostook has ordered 100 steel underframes and superstructures from the Standard Steel Car Co.

The Chicago & North Western has contracted with the Illinois Car & Mfg. Co. for 650 steel underframes and superstructures and with the Siems-Sternbel Co. for 685.

The Northern Pacific has given an order to the Ryan Car Co. for 300 general service gondola cars.

Swift & Co., packers, have ordered 300 steel underframes for refrigerator cars from the Pressed Steel Car Co.

The Atlantic Coast Line has ordered 50 steel underframes from the Virginia Bridge & Iron Co.

The Norfolk & Western is inquiring for 1000 57½-ton steel hopper car bodies.

The Ebensburg Coal Co. has placed an order for 600 mine cars with the Bethlehem Steel Co.

The Stonega Coal & Coke Co. has ordered 450 coal cars from the American Car & Foundry Co., 450 from the Watt Car & Wheel Co. and 100 from the Enterprise Wheel & Car Corporation.

The Lehigh & Hudson River has placed 2 locomotives with the Baldwin Locomotive Works.

The Great Northern has purchased 300 gondola cars from the Ryan Car Co.

The Pere Marquette is asking for prices on 1000 box car underframes.

The Santa Fe is inquiring for 150 caboose cars.

The Southern Pacific has entered the market for 75 passenger cars.

The Canadian National Railways have placed orders for 20 locomotives each with the Canadian Locomotive Works, Kingston, Ont., and the Montreal Locomotive Works; 14 locomotives each will be built by the American Locomotive Co. and the Lima Locomotive Works for its Grand Trunk Western lines and the Central Vermont Railway. The Canadian National has also placed 200 refrigerator cars and 15 snow plows with the Eastern Car Co., Trenton, N. S.

January production of automobiles in Canada, as reported by the Dominion Bureau of Statistics, was 11,745 passenger cars and 3631 trucks, compared with December output of 6052 passenger cars and 1700 trucks. Production in January, 1926, was 11,781 passenger cars and 3698 trucks.

PERSONAL

Albert J. Davis has resigned as president of the Manufacturers and Merchants' Association of St. Louis to become vice-president in charge of sales, Scullin Steel Co., St. Louis, succeeding George L. L. Davis, resigned, effective March 1. The former Mr. Davis was in the investment business until November, 1917, when he was placed in charge of the first United States Army Ordnance office in St. Louis. In July, 1918, he resigned to become president of the Employers' Association, an organization advocating open shop in all industries, and since 1921 has been president of the Manufacturers and Merchants' Association. Alvin C. Carpenter, vice-president Bemis Brothers Bag Co., has been elected president of the association to succeed Mr. Davis, and will assume his new duties on March 15.

A. J. DAVIS

—

J. C. Buck, for several years engaged in sales development on tool steels and tools, has been appointed a sales engineer in the Chicago office of the Cyclops Steel Co., Titusville, Pa.

—

William H. Allen, 110 State Street, Boston, has been appointed New England manager for the Earle Gear & Machine Co., Philadelphia.

—

Leroy M. Lewis has been elected president of the Central Automatic Sprinkler Co., Philadelphia, to succeed the late Louis Lewis. He will also act as assistant treasurer. Other new officers elected are E. O. Lewis, vice-president; Charles Christos, treasurer, and R. G. Wheeler, secretary. These men, together with E. E. Zimmerman, make up the company's new board of directors.

—

Charles T. Spinning has left the Graham Bolt & Nut Co., Pittsburgh, to engage in business on his own account. He is located at 2101 Wharton Street, Pittsburgh, and will represent the Neely Nut & Bolt Co., the Pittsburgh Rivet Co., the Coover Railroad Track Brace Co., and the Cleveland Cap Screw Co.

—

S. P. Broome has been appointed eastern district manager of sales Pittsburgh Crucible Steel Co., and will be in charge of the Philadelphia and New York district sales offices, with headquarters in Philadelphia.

—

W. H. Smith has been elected president and treasurer of the W. M. Pattison Supply Co., Cleveland, to succeed the late W. M. Pattison. Mr. Smith was one of the organizers of the company in 1897 and had been its vice-president since that time. C. E. McCombs has been elected vice-president, A. C. Vaughan, secretary, and C. E. Pattison, second vice-president.

—

H. R. Eicher, sales promotion and advertising manager Duro Pump Co., Dayton, Ohio, has been appointed assistant general sales manager for the company. He has been associated with the company four years and in addition to his new duties will continue as head of the sales promotion and advertising departments in an advisory capacity.

—

H. V. Nye, engineer in charge of the Reyrolle switchgear department, Allis-Chalmers Mfg. Co., Milwaukee, was the principal speaker at the February dinner meeting of the Engineers' Society of Milwaukee.

—

Carl P. Dennett, managing director Griffin Wheel Co., has been made a director of the John Hancock Mutual Life Insurance Co., Boston. He is vice-president of the Boston Chamber of Commerce and a director of the First National Bank of that city.

—

Henry S. Chafee, Builders Iron Foundry, Providence, has been nominated for the presidency of the Associated Alumni of Brown University. He is president of the New England Foundrymen's Association.

—

Emmett B. Moseley, superintendent Hartford Screw Machine Co., Hartford, Conn., has been made works manager Welker-Hoops Mfg. Co., Middletown, Conn. For many years he was associated with the Burroughs Adding Machine Co.

—

H. A. Call has been appointed Midwestern representative of the Copper and Brass Research Association, 25 Broadway, New York, and will establish a branch office for the organization in St. Louis.

—

A. S. Kurtz, associated for the last 26 years with the Milton Mfg. Co., Milton, Pa., and more recently district sales manager for the company in the Eastern States, was tendered a testimonial dinner by business and personal friends on Feb. 17 at the Machinery Club, New York.

—

Paul M. Mueller, formerly associated with the Pratt & Whitney Co., Hartford, Conn., is now manager of the lock division, Hartford Screw Machine Co., Hartford.

—

William DeBaufre, chairman of the mechanical engineering department, University of Nebraska, Lincoln, is on a leave of absence from the university and is acting in a technical advisory capacity for the International Combustion Engineering Corporation, New York.

—

J. E. Dalrymple, who recently retired as vice-president in charge of traffic, Canadian National Railways, has been elected president of the Canadian Coal, Ltd., Canadian Cement Building, Montreal, a new Canadian steam and gas coal company which is affiliated with the North American Coal Corporation, Cleveland. The Canadian company has been operating in a small way for six years, but it plans considerable expansion, and its activities will extend from the head of the Great Lakes to the Atlantic. The new president entered railroad service in 1883 as a junior clerk in the treasurer's office of the Grand Trunk Railway Co. of Canada, and has been connected with a number of railroads, mostly in Canada, in various capacities.

J. E. DALRYMPLE

—

Clarence E. Guthridge has been appointed assistant general manager of sales for the Oliver Iron & Steel Corporation, Pittsburgh. He has been associated with the company for 28 years, recently as assistant sales manager.

—

B. Mifflin Hood, president B. Mifflin Hood Brick Co., Atlanta, Ga., has been elected president of the American Ceramic Society for 1927 and 1928. Other new officers are M. C. Booze, Charles Taylor & Sons Co., Cincinnati, vice-president; H. B. Henderson, Standard Pyrometric Cone Co., Columbus, Ohio, treasurer, and Ross C. Purdy, Ohio State University, Columbus, secretary. In the refractories division L. C. Hewitt, St.

Louis, is chairman; L. J. Trostel, Baltimore, vice-chairman, and E. H. Van Schoick, Ottawa, Ill., secretary.

—

P. L. Keiser, until recently president Steel Plate Products Co., Pottstown, Pa., has sold his interests in that company and has organized the Pottstown Metal Products Co., Inc., Pottstown, of which he is president.

—

J. Fulton Johnson, for seven years purchasing agent for the Salisbury Axle Co., Jamestown, N. Y., has resigned, effective March 1, and has not yet announced his plans. He was formerly purchasing agent for the Paige-Detroit Motor Car Co., Detroit, and came to the Salisbury company at the time of its organization in 1919. He is president and treasurer of the Pearl City Paint & Glass Co. and of the Louis Lucal Co., Inc., both of Jamestown.

—

Charles E. Scott, president Scott-Pierce Motor Co., Detroit, has purchased the controlling interest in the Precision Gauge & Tool Co., 6482 Epworth Boulevard, Detroit. He is vice-president and general manager of the latter company and William F. Spath is president. Business offices will be maintained at 501 Transportation Building, Detroit.

—

George W. Llewellyn has been appointed district sales manager in Detroit and the State of Michigan for the Seneca Iron & Steel Co., Buffalo, and will be located in Central Motors Building, Detroit. George M. Beard will continue to be associated with Mr. Llewellyn in the Detroit office. Harry J. Ward, formerly located in the Michigan city, has been transferred to Toledo, Ohio, and will represent the company in western Ohio and Indiana.

—

Frank L. Estep, member of the consulting engineering firm of Perin & Marshall, New York, returned March 2 from a brief trip to Europe.

—

Racine Ripley has been placed in charge of the office recently opened in the Stephenson Building, Detroit, by the Chambersburg Engineering Co., Chambersburg, Pa.

—

William A. Knapp, formerly secretary of the Butler Mfg. Co., Kansas City, Mo., has been elected vice-president of the company and will have charge of sales and advertising. He has been associated with the Butler organization for 17 years. Fred A. Rufi has been elected secretary to succeed Mr. Knapp and will have charge of purchases. He has been identified with the company for 18 years and was formerly assistant to the first vice-president.

—

E. S. Black has rejoined the sales and engineering staff of the American Manganese Steel Co., Inc., Chicago Heights, Ill., in the capacity of consulting engineer. A. H. Exton has also returned to the company as chief engineer. Both men will maintain headquarters at Chicago Heights.

—

E. J. Lowry, metallurgist Hickman, Williams & Co., whose headquarters heretofore have been at Chicago, has been transferred to the New York office of that company.

December exports of automobiles are estimated by *Automotive Industries* at 26 per cent of the total production of the industry, probably the highest ratio so far established. January proportion was not, of course, relatively high, but there was an actual gain in volume in the exports of the first month of the year.

The Koppers Construction Co., Pittsburgh, will erect a by-product coke and gas plant for the Brooklyn Union Gas Co., at Brooklyn, calling for 74 Becker type combination coke and gas ovens and 9 Koppers gas producers with coal and coke handling system and equipment for recovery of by-products.

OBITUARY

EDGAR S. ROBINSON, vice-president Alloy Steel Corporation, South Chicago, and a son of Theodore W. Robinson, vice-president in charge of operations Illinois Steel Co., died on Feb. 25. He was graduated from Harvard University in 1914 and from the Massachusetts Institute of Technology in 1916. He was a commissioned officer at the Great Lakes Training Station, Great Lakes, Ill., and a lieutenant in charge of construction at the Newport News, Va., training camp during the World War.

E. S. ROBINSON

—

FLEMING E. JAMIESON, JR., assistant superintendent 14-in. mill, Jones & Laughlin Steel Corporation, Woodlawn, Pa., died Feb. 25. He was a son of F. E. Jamieson, manager of orders, Jones & Laughlin Steel Corporation, and had been identified with that company since his graduation from Cornell University in 1923.

—

ALBERT BALL, for nearly 50 years chief engineer Claremont, N. H., works, Sullivan Machinery Co., Chicago, and widely known as an inventor of mining and quarrying machinery, died Feb. 7 at his home in Claremont, N. H. He was born at Boylston, Mass., in 1835, and first began to develop an inventive aptitude in the employ of L. W. Pond at Worcester, Mass. Later he became associated with Lamson, Goodnow & Yale, Windsor, Vt., machinery manufacturers, and here gave his attention to the development of firearms, the most noteworthy result of which was the Ball rifle. He came to Claremont in 1868 with J. P. Upham & Co., later the Claremont plant of the Sullivan company, and was associated with the company continuously until his retirement in 1914. Among his more important inventions were diamond core drills for mineral prospecting and test boring, direct acting steel channeling machines for quarrying, various types of rock drills and drill mountings, air driven coal pick machines, quarry bars and many other devices not connected with the mining industry. Since his retirement Mr. Ball had devoted his attention to the making of violins and had developed special machinery for the execution of unique wood patterns.

—

HUGH MCLEOD, owner of the Porter Machine Co. and of the Hampshire Mfg. Co., Hatfield, Mass., died at his home in that town Feb. 22. He was born at Wine Harbor, N. S., in 1867 and studied mechanical engineering at Worcester, Mass.

—

JACOB JAMES HOLLOWAY, a director and member of the executive committee of the Wheeling Steel Corporation, Wheeling, W. Va., died Feb. 27 at St. Petersburg, Fla. He was born at Bridgeport, Ohio, and was graduated from Western Reserve College, Cleveland, in 1878. He had been interested in the Wheeling corporation for a number of years and was also a director of the Wheeling Sanitary Mfg. Co., the Wheeling Traction Co., the Wheeling Bridge Co., the Superior Tube Co., the Hazel-Atlas Glass Co. and the Fostoria Glass Co.

Total apparent consumption of babbitt metal in January, based on reports received by the Department of Commerce from 27 firms, was 4,975,552 lb., as compared with 4,012,677 lb. in December and with 5,152,694 lb. in January, 1926.

BLAST FURNACE CENSUS

Output in Tons and Values in 1925 vs. 1923—Pig Iron and Ferroalloys Covered

PRODUCTION of pig iron in 1925, according to preliminary statistics of the Bureau of Census, amounted to 36,131,136 gross tons, against 39,747,250 gross tons in 1923, the last preceding census. Production of ferroalloys in blast and electric furnaces for the respective years aggregated 556,868 tons and 607,947 tons. Of the 1925 ferroalloy output 259,780 tons was ferromanganese, against 259,677 tons in 1923, a difference of only 103 tons. Under the new classification of pig iron and ferroalloys the Bureau of Census has separated the output of the two products. Previously, the total output of blast furnaces, including pig iron and ferroalloys, was combined, while production of ferroalloys by the electrolytic process was shown under the census of the Chemical Industry.

The predominating position of basic iron from a point of production is shown in the census figures for both 1925 and 1923, the totals being 18,945,109 tons and 19,899,179 tons. The output of Bessemer iron, taking second rank in production, aggregated 8,935,381 tons in 1925 and 10,704,994 tons in 1923.

Value of Products

Pig iron and ferroalloys in 1925, aggregating 36,688,002 tons, valued at $761,605,465, showed decreases of 9.1 per cent and 24.3 per cent, respectively, as compared with 40,355,197 tons, valued at $1,005,882,578, for 1923. The total for 1925 comprised 27,715,651 tons, valued at $553,900,949, of pig iron and ferroalloys made in blast furnaces and consumed in steel works and rolling mills and foundries under the same ownership as the blast furnaces. This amounted to 75.5 per cent of the total production in 1925, against 73.2 per cent in 1923.

Blast furnaces were operated in 1925 by 122 establishments, 36 of which were located in Pennsylvania, 27 in Ohio, 14 in Alabama, eight in Michigan, eight in New York, six in Illinois, four in Tennessee, four in Virginia, three in Indiana, three in West Virginia, two in Kentucky, two in Minnesota, two in Wisconsin, one in Colorado, one in Maryland and one in Utah. Ferroalloys made in electric furnaces and as secondary products of the zinc-smelting industry were reported by 19 establishments, six of which were located in New York, four in Pennsylvania, three in Ohio, one in Alabama, one in Iowa, one in New Jersey, one in Tennessee, one in Virginia and one in West Virginia.

In 1923 the blast furnace industry was represented by 169 establishments, the decrease to 122 in 1925 being the net result of a gain of one establishment and a loss of 48, of which eight had gone out of business prior to the beginning of 1925, and 40 were idle during the entire year.

Table I—Summary for Blast Furnaces: 1925 and 1923

	1925	1923	Per Cent of Decrease
Number of establishments	122	169	27.8
Wage earners (average number)(a)	29,188	36,712	20.5
Maximum month	Feb. 32,421	June 39,767	...
Minimum month	Aug. 26,844	Jan. 31,777	...
Per cent of minimum	82.8	79.9	...
Wages(a)	$45,312,168	$58,935,384	23.1
Cost of materials (including fuel)	617,416,880	827,629,665	25.4
Value of products	765,286,229	1,007,613,340	24.0
Value added by manufacture	147,869,349	179,983,675	17.8
Horsepower	1,380,394	1,832,919	24.7

(a) Statistics for wage earners and wages for 1925 are not strictly comparable with those for 1923, for some blast-furnace operators included data in 1923 reports (but not in 1925) for wage earners engaged in relining blast furnaces.

Table II — Products, by Class, Quantity, and Value: 1925 and 1923

	1925	1923
Total value	$782,157,795	$1,028,512,425
Products of the blast furnace industry	$765,286,229	$1,007,613,340
Ferroalloys made in electric furnaces and as secondary products of zinc smelting industry	$16,871,566	$20,899,085
Pig iron and ferroalloys:		
Gross tons	36,688,002	40,355,197
Value	$761,605,465	$1,005,882,578
For consumption in other works under same ownership—		
Gross tons	27,715,651	29,559,662
Assigned value	$553,900,949	$702,344,387
For sale—		
Gross tons	8,972,351	10,795,535
Value	$207,704,516	$303,538,191
Blast furnace gas used as fuel for steam and for gas engines, coal equivalent, gross tons	9,409,936	9,029,990
Blast furnace departments, gross tons	4,777,564	4,963,655
Other departments—		
Gross tons	4,632,372	4,066,335
Assigned value	$17,004,317	$17,033,976
Slag (granulated; slag for roofing, paving, etc.)	$1,686,881	$1,344,628
All other products, including amount received for custom work	$1,861,132	$4,251,243

Table III—Pig Iron and Ferroalloys, Classified by Grade

(In Gross Tons)

Total	36,688,002	40,355,197
Basic	18,945,109	19,899,179
Bessemer	9,835,381	10,704,994
Foundry	5,182,279	6,791,418
Malleable	1,575,057	1,552,682
Low phosphorus	269,822	310,889
Forge or mill	233,634	278,682
White, mottled and miscellaneous	45,357	134,347
Direct castings made in blast furnaces	44,497	75,060
Ferroalloys	556,866	607,947
Ferromanganese	259,780	259,677
Other ferroalloys	297,086	348,270

Table IV—Equipment—Furnaces in Active Establishments: (a) 1925 and 1923

(In Gross Tons)

[No data included for establishments producing ferroalloys by the electric furnace process, nor for zinc smelting establishments which made ferroalloys as secondary products.]

	1925	1923
Completed furnaces at end of year:		
Number	310	368
Daily capacity, tons	135,580	141,555
Active during the year:		
Number	285	350
Daily capacity, tons	127,205	137,035
Coke—		
Number	277	331
Daily capacity, tons	126,468	135,381
Charcoal—		
Number	7	14
Daily capacity, tons	562	1,084
Other fuel—		
Number	1	5
Daily capacity, tons	175	570
Idle during the year:(b)		
Number	25	18
Daily capacity, tons	8,375	4,520
Coke—		
Number	25	17
Daily capacity, tons	8,375	4,445
Charcoal—		
Number	....	1
Daily capacity, tons	....	75
Banked or out for relining at end of year:		
Coke—		
Number	33	30
Daily capacity, tons	14,895	11,887
Charcoal—		
Number	1	....
Daily capacity, tons	60	....
Other fuel—		
Number	....	4
Daily capacity, tons	....	472
In course of construction at end of year (all coke):		
Number	2	3
Daily capacity, tons	1,250	1,396
New furnaces completed since 1923 (all coke):		
Number	3	....
Daily capacity, tons	1,155	....
Abandoned or dismantled since 1923:		
Number	7	....
Daily capacity, tons	1,540	....

(a) Includes data for all establishments which operated one or more furnaces during any part of the year.

(b) Not including data for furnaces in establishments which were idle during the entire year.

Continental Export Prices Declining

German Export Bounties Higher—Poland Asks 2,000,000 Ton Cartel Quota and Britain 9,500,000 Tons—Germany May Withdraw

(*By Cable*)

LONDON, ENGLAND, Feb. 28.

PIG IRON continues quiet with furnaces making good deliveries, but consumers not active in purchasing. Cleveland foundry and forge iron are unchanged, but hematite prices are easier for forward delivery. Sellers are accepting £4 9s. ($21.58) per ton, for East Coast, mixed numbers. Foreign ore is still quiet.

Finished steel users are pressing for deliveries on contracts, especially for shipbuilding material. Steel mills are operating full, wherever possible, but deliveries are still in arrears, large makers requiring in some cases up to 16 weeks on current bookings. Consequently, it is difficult to close business.

The Clyde shipbuilding output in February was the lowest on record, with only 14 small vessels totaling 8000 tons.

Tin plate prices are firmer as costs of foreign steel increase, but business generally is quiet. Some fair inquiries are in the market, however, including some substantial lots for domestic consumers, but few sales have as yet been recorded. Prompt and forward tin plate is now about 20s. per base box, ($4.85) f.o.b. works port.

Galvanized sheets continue quiet, but makers of No. 24 gage corrugated sheets, being well booked, are reluctant to grant any further concession. Black sheets are inactive. Japanese specification thin sheets have been reduced to £14 10s. ($70.32) per ton f.o.b. works port.

Continental markets are firm as a result of the reluctance of most works to enter into future commitments. Semi-finished products are especially firm and supplies are limited. Various makers are awaiting official announcement of the distribution of the raw steel quota for second quarter, which is expected to be announced at the meeting March 4.

German Export Bounties Increased for March—Domestic Prices Unchanged

(*By Radio*)

BERLIN, GERMANY, Feb. 28.

HOME selling prices of the pig iron and the steel syndicates for March are unchanged. The Raw Steel Syndicate has again increased bounties to exporting manufacturers, by 5m. ($1.18) per ton for ingots and blooms, 8m. ($1.90) per ton for slabs and by 2m. (47c.) per ton for heavy sheets. Since November the bounty on ingots has been increased by 15m. ($3.55) per ton.

The pig iron market is quiet but the domestic market for products of the steel syndicate is active, except in thin gage sheets.

Foreign trade is quieter, particularly in semi-finished products, but there are signs of recovery, bars in the past few days having slightly advanced in export transactions. Steel men in Düsseldorf predict a general revival of trade by April.

German Cartel Adherence Based on French Commercial Treaty

BERLIN, GERMANY, Feb. 8.—Establishment of the International Raw Steel Cartel cannot be considered as definitely completed until a general Franco-German commercial treaty has been signed. This was the condition upon which the German Ministry of Industry sanctioned the entry of Germany into the cartel and, under the terms laid down by the ministry, such a treaty must be signed before April 1 of this year. The treaty must contain such French concessions for the importation of German manufactured iron and steel products as will compensate German producers for the higher prices of materials which the existence of the cartel involves.

Several weeks ago Minister of Industry Luther declared that this condition must be fulfilled or Germany will consider herself free to denounce the cartel agreement. Not long ago Dr. Bruno Bruehn, prominent in the Westphalian steel industry and one of the origi-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, f.o.b..	£1	6s.	to £1	7s.	$6.30	to	$6.54
Bilbao Rublo ore†..	1	2	to 1	2½	5.33	to	5.45
Cleveland No. 1 fdy.	4	7½			21.22*		
Cleveland No. 3 fdy.	4	2½			20.00*		
Cleveland No. 4 fdy.	4	1½			19.76*		
Cleveland No. 4 forge	4	1			19.64*		
Cleveland basic	3	15	to 3	15½	18.18	to	18.30
East Coast mixed....	4	9	to 4	10	21.58	to	21.82
East Coast hematite	4	8	to 4	12½	21.34	to	22.43
Rails, 60 lb. and up	7	15	to 8	0	37.58	to	38.80
Billets	7	5	to 7	10	35.16	to	36.37
Ferromanganese ...	16	0			77.60		
Ferromanganese (export)	15	15			76.38		
Sheet and tin plate bars, Welsh	6	5	to 6	10	30.31	to	31.52
Tin plate, base box..	1	0	to 1	0¼	4.85	to	4.91
Black sheets, Japanese specifications	14	10			70.32		
					C. per Lb.		
Ship plates	8	10			1.84		
Boiler plates	11	0	to 11	10	2.38	to	2.49
Tees	8	12½	to 9	2½	1.86	to	1.98
Channels	7	17½	to 8	7½	1.70	to	1.81
Beams	7	12½	to 8	2½	1.65	to	1.76
Round bars, ⅝ to 3 in.	8	5	to 8	15	1.78	to	1.89
Steel hoops	10	10	to 11	0	2.28	to	2.39
Black sheets, 24 gage	11	2½	to 11	7½	2.32	to	2.46
Galv. sheets, 24 gage	15	0	to 15	5	3.24	to	3.30
Cold rolled steel strip, 20 gage, nom.	13	0			2.91		

*Export price, 6d. (12c.) per ton higher.
†Ex-ship. Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	12s.	to £3	18s.	$17.70	to	$18.90
France	3	12	to 3	18	17.70	to	18.90
Luxemburg	3	12	to 3	18	17.70	to	18.90
Basic pig iron:								
Belgium	3	8			16.49		
France	3	8			16.49		
Luxemburg	3	8			16.49		
Coke	0	18			4.37		
Billets:								
Belgium	4	10			21.82		
France	4	10			21.82		
					C. per Lb.		
Merchant bars:								
Belgium	4	19	to 5	1	1.09	to	1.11
Luxemburg	4	19	to 5	1	1.09	to	1.11
France	4	19	to 5	1	1.09	to	1.11
Joists (beams):								
Belgium	5	0			1.10		
Luxemburg	5	0			1.10		
France	5	0			1.10		
Angles:								
Belgium	5	0			1.10		
¼-in. plates:								
Belgium (nominal)	6	11			1.43		
Germany (nominal)	6	11			1.43		
⅜-in. ship plates:								
Belgium	6	1			1.32		
Luxemburg	6	1			1.32		
Sheets, heavy:								
Belgium	6	2	to 6	4	1.33	to	1.34
Germany	6	3	to 6	4	1.33	to	1.34

(a) Nominal.

nal negotiators of the cartel, said that such agreements do not exclude competition and antagonism, but merely replace "competition for markets" with "competition for quotas." This statement, perhaps, sums up the present difficulties.

German mills are highly dissatisfied with their quotas, although soon after the formation of the cartel, the German quota was increased from 40.5 per cent to 43.176 per cent. German producers, however, claim that conditions have changed considerably since establishment of the cartel. Quotas were based on the actual production in the first quarter of 1926 and in that quarter German output was low, while French and Belgian production, favored by the low exchange value of the franc, was high. Since then stabilization of the French and Belgian currency at a higher level has rendered it difficult for either of these countries to dispose of their output, while German domestic trade has improved and even with smaller export business the mills are able to dispose of all they can produce.

As a direct result of this situation German mills have exceeded their combined quotas in the cartel by 9.3 per cent in September, 12.3 per cent in October, 20.7 per cent in November and 25.2 per cent in December. For this excess production of four months, German members have been obliged to pay into the cartel treasury in fines a total of $2,690,000.

While this does not provide adequate case for German withdrawal from the cartel, many leading steel producers of Germany would undoubtedly view with satisfaction failure of negotiations for signature to the pending treaty. It is, however, likely that a slight change will be made in the cartel agreement, reducing the amount of penalty for excess production. As German mills are at present largely occupied with production for the domestic market and both France and Belgium are in serious need of more export trade, it has been suggested that, in exchange for a modification of the penalties for overproduction, Germany should for the present leave much of the export business to the French and Belgian mills. At the cartel meeting in Luxemburg next month it is generally expected that production quotas will be further reduced.

At the recent meeting, at which Austria, Hungary and Czechoslovakia were brought into the cartel, the British steel industry was not represented. The lowest quota which the British industry will accept is 9,500,000 tons a year and the highest offer made by the cartel is a quota of 8,500,000 tons a year.

At a meeting on March 4 Austrian, Hungarian and Czechoslovakian makers of rails are expected to join the European Rail Makers' Association.

Negotiations are under way in Luxemburg for the establishment of an international wire rod syndicate to include German, French, Belgian and Luxemburg mills.

German and Czechoslovakian manufacturers of cast iron pipe are understood to have come to an agreement on deliveries of pipe to Austria, Jugoslavia and Rumania.

GERMANS DISCLAIM DUMPING

Export Prices Equal to French and Belgian Levels—Steel Rebates Reduced

BERLIN, GERMANY, Feb. 8.—Decision of the United States Treasury Department that German pig iron is being dumped in the United States is severely criticized in the trade press. It is claimed that German prices for pig iron are not "unfair," the export sales price being based, as in the case of steel products, on the "world market" price. In consequence, the selling price is not lower than the quotation on French and Belgian pig iron. Although the German domestic price of pig iron is considerably higher than the domestic market in France and Belgium, the attitude is that this is a German domestic question.

For February, the rebates on steel purchased by manufacturers for export show a considerable increase. In the final quarter of last year, as a result of a stronger export market, the rebates were reduced. With the recent decline in "world market" prices, these rebates have been advanced. The following are the German domestic market and the "world market" quotations, in marks per metric ton, as established for February:

	Domestic		World Market	
Ingots	100	$23.70	85	$20.15
Blooms	105	24.89	90	21.33
Billets	112.50	26.66	98	23.23
Slabs	117.50	27.85	102	24.17
Shapes	131	31.28	102	24.17
Wire rods	139.30	33.00	120	28.44
Black sheets, 5 mm. and more	148.90	35.29	127	30.10
Bars	134	31.76	102	24.17

The rebates paid in February are the difference between the domestic and the world market price. The extent to which this system aids export is difficult to estimate, but that it is effective seems evident from the increase in export business under the rebate system. Exports of iron, steel and machinery in 1913 totaled 6,497,000 metric tons; in 1925, 3,548,000 tons, and in 1926, 5,348,000 tons. However, imports also show some increase, although 1926 marked a slight decline from the previous year. In 1913, imports of iron, steel and machinery totaled only 613,000 tons. In 1925 1,449,000 tons were imported and in 1926 1,261,000 tons.

The Railroad Car Construction Corporation, which includes 30 car building companies, has been finally established and has entered into an agreement with the Railroads Corporation covering orders in the first half of this year. The Railroads Corporation is making its first experiments with aluminum-body cars.

BELGIAN PRICES DECLINE

Buyers Hesitate As Mills Offer Concessions—Some Makers on Five-Day Week

ANTWERP, BELGIUM, Feb. 12.—Weakness of prices continues and business is poor in all products. Buyers continue to withhold purchases as long as possible, in expectation of further decline in prices. Foreign purchasing is confined to small lots and China, usually one of the best markets for Belgian products, is buying practically nothing. A slight improvement in inquiry is reported from a few markets, however, so that an early recovery of export trade may develop.

Many mills, with order books seriously depleted, are forced to book business at concessions, so that prices are generally soft and vary considerably, depending upon the circumstances of the purchase. In a few instances, mills unable to book sufficient business have had to curtail operations and are closing for one or two days a week. Competition from French mills in need of tonnage continues a serious factor in the domestic and export markets. German competition is increasing, particularly on bars and beams.

Pig Iron.—Demand is small and the tendency of the market is downward. Although coke prices have been reduced slightly, furnaces have not yet revised the official quotation on pig iron, which continues at 700 fr., about $19.45 per metric ton, f.o.b. furnace, for No. 3 foundry. For export No. 3 foundry is quoted at about $17.80 per ton, f.o.b. Antwerp. For forward delivery, resale iron has been sold at even lower prices. The new price of coke is 250 French fr. ($6.95) per ton, with a few sales made as low as 200 French fr. per ton.

Semi-Finished Steel.—Prices are nominal with only a few small transactions reported. Some makers are not quoting on semi-finished material at present, claiming that prices are too low for profit and awaiting the result of negotiations for sale of such material through the steel cartel. Billets, 2 in. and smaller, are quoted at $21.80 per ton, f.o.b. Antwerp, and $21.50 per ton for larger than 2 in. Blooms are quoted at $20.10 for 6-in. and larger, $20.35 per ton for 5-in. and $20.85 for 4-in.

Finished Material.—Buying is confined to small lots for immediate requirements and prices are soft with a distinct downward trend. In export trade, German mills are advancing lower prices than recently and French competition continues keen. As a result of this

downward movement of the market both domestic and export buyers are delaying purchases. As prices at which business is transacted vary widely, it is difficult to determine the current market price of most products. Nominally bars are as low as £4 15s. (1.04c. per lb.) and beams at about the same level. Corrugated bars are quoted at £5 10s. per ton (1.21c. per lb.) and hoops at £6 5s. per ton (1.37c. per lb.), all f.o.b. Antwerp.

POLAND SETS CARTEL QUOTA

Demands 2,000,000 Tons Although Annual Output Has Been Less Than Half

WARSAW, POLAND, Feb. 11.—The plan of Polish works to join the International Raw Steel Cartel has come nearer to accomplishment since Austria, Czechoslovakia and Hungary have joined. Although Polish mills were not represented at the recent meeting, willingness to join the cartel, in principle, was communicated. The chief internal difficulty of Polish industry has been the fact that the Polish steel works in Upper Silesia did not belong to the Polish Steel Syndicate. Recently, however, these mills have joined, so that the industry may now act as a unit in further negotiations.

Another obstacle to inclusion of Poland in the cartel is the question of a quota. At the latest conference of the Polish steel industry at Warsaw, it was unanimously decided to demand a quota in the cartel, equal to the production of 1913 plus 10 per cent. The output of 1913 was 1,764,732 metric tons and the decision of the conference was to demand 2,000,000 tons. If persisted in, this quota will cause difficulties, as the actual annual steel production of Poland in the past two years has been much less than half this proposed quota and the countries now in the cartel entered on the basis of their production in the first quarter of 1926.

The Polish output of pig iron in 1926 was 327,520 tons and of steel ingots 788,544 tons, with rolled products at 570,343 tons. Production of steel in 1925 was 783,273 tons and in 1924 was 679,744 tons.

FRENCH EXPORT TRADE SMALL

Prices Decline As Mills Seek Tonnage—Workers on Part Time

PARIS, FRANCE, Feb. 11.—The franc has been declining by a few centimes a day recently and there are reports that the currency may finally be stabilized at 125 to 130 fr. to the pound sterling, about 3.73c. to 3.88c. to the franc. If this could be definitely known, business would doubtless benefit, as there would be prospect then of stable prices. Meanwhile, however, mills are maintaining limited operation on orders that come in from week to week and in many instances are producing for stock. In some cases, mills are reducing their forces beginning with the less skilled workers, while others are operating part time to avoid wage reductions, which it is felt would lead to labor difficulties because of the high cost of living. Export trade is steadily growing worse, with only a small volume of inquiry from foreign markets and competition among the mills so keen that buyers delay purchase as long as possible to secure the lowest possible price.

Pig Iron.—Demand has declined so considerably that seven furnaces have been blown out recently. No. 3 phosphoric foundry iron has settled to 510 fr. ($19.95) per ton and a still lower price is expected if coke is again reduced. Since Feb. 8, hematite iron has dropped 20 fr. (78c.) per ton. In the Lyons district, which serves as a basis, hematite for foundry use has dropped to 650 fr. ($25.42). In the North the quotation is 620 fr. ($24.24) per ton. Since Dec. 14, hematite foundry has declined about 120 fr. ($4.70) per ton. In the North and Pas-de-Calais metallurgical coke has declined to 190 fr. ($7.43) per ton f.o.b. ovens, which is 6 to 8 fr. per ton higher than the price of German coke delivered. With pig iron production declining rapidly, the coke surplus is increasing and negotiations have been instituted with the German Coal Syndicate with a view to reducing reparations shipments from 300,000 to 250,000 tons per month. Despite the small demand for export pig iron, prices are being maintained. Belgian pig iron is quoted at £3 15s. ($18.18) per gross ton, f.o.b. Antwerp for United Kingdom consumers and at £3 18s. ($18.90) per gross ton for other foreign markets. For Switzerland the quotation is 97.50 fr. (Swiss) ($18.75) per metric ton, f.o.b. Basle, ex-duty; for Austria £3 12s. ($17.45) per metric ton, delivered Wintersdorf; and for Italy £3 12s. 6d. ($17.58) per ton f.o.b. Thionville.

Finished Material.—Despite the approach of spring construction work, the price of beams continues weak. Applications for building permits, particularly in the Paris area, have been numerous and more activity may develop shortly. In export trade, however, prices show less and less strength, so that with recent reductions the quotation is about £4 15s. to £4 17s. 6d. per ton (1.04c. to 1.07c. per lb.) on plain bars.

IMPORT PRICES LOWER

Foreign Steel Lower But Competition of Domestic Sellers Is Keen—Japan Buys Rails

NEW YORK, March 1.—In both export and import of iron and steel there is a fair volume of small inquiries in the market, but purchasing is limited. Importers in the United States have been quoting on numerous small lots of steel bars and structural material, ranging from 40 or 50 tons up to several hundred tons, but a few sizable tonnages have been under consideration.

Prices on imported steel range from 1.65c. to 1.75c. per lb., base, c.i.f. Atlantic port, for plain steel bars. With American makers, however, in a more competitive position, these quotations are, in many cases, "asking prices," and on desirable business a lower level has been obtained.

No definite action has been taken as yet by the Treasury Department in respect to the investigation of German steel dumping, but in view of the possibility that this act will be invoked, it is understood that importers in New York are holding a meeting this week. It is also reported that importers of pig iron may protest the recent ruling of the Treasury Department that German pig iron had been dumped.

Exporters of American steel products report a fair volume of inquiry from Japan for small lots of material, but purchasing is small. Cuban and South American business continues to be confined to small orders for 50 to 100 tons and even less.

Among the larger inquiries from Japan is the call for bids from the Imperial Government Railways for 8266 tons of 100-lb. rails and splice bars, bids on which were opened in Tokio, Feb. 28. The government railroads are also in the market for 150 tons of channels for bridge construction and about 90 tons of either "Armco" or copper-bearing steel sheets. The inquiry of the South Manchuria Railway Co. for 30 miles of 100-lb. rails brought out a low bid from De Wendel & Co. in France. The lowest American quotation is understood to have been from the leading export interest. Exporters to Japan expect that the contract will probably be awarded to the De Wendel works at about £7 12s. 6d. per ton, about $37, delivered Japan.

Current inquiry from Japan for tin plate is for small lots of a few hundred boxes. One such inquiry specifies 500 base boxes. Quotations range from $5.75 to $5.85 per base box, c.i.f. Japan. There are a few small inquiries for light gage sheets in the market, but in most cases the buyer offers only $76 to $78 per ton, c.i.f. Japan, while the current market is $81 to $82 per ton, although slightly less might be done on a desirable tonnage. The municipality of Yokohama is asking for 265 tons of I-beams. Recent export quotations on structural material and bars, by American makers, are reported to have ranged from 1.55c. to 1.65c. per lb., base Pittsburgh.

Machinery Markets and News of the Works

RAILROAD MAY BUY 30 TOOLS

Missouri Pacific Issues Inquiry for Equipment for Various Shops

Machine Tool Business Not Active and Sellers Are Disappointed by Small Volume of Business

THE Missouri Pacific Railroad has issued an inquiry from St. Louis for about 30 items of shop equipment for its various repair plants. Railroad business is more promising than other lines. The Union Pacific is preparing a list which probably will be sent to the trade late this month. The Chicago & Eastern Illinois is in the market for a few large tools. The Delaware & Hudson has bought two carwheel borers.

Machine tool sellers do not conceal their disappointment over the failure of prospective buyers to close on inquiries which have been pending for some time. Seldom in recent years have inquiries been more numerous than now, but sellers experience great difficulty in converting them into orders.

February sales were about on a level with those of January. With some companies they may have been slightly better.

About 300 used tools, the property of the National Motor Car & Vehicle Corporation, Indianapolis, were disposed of at public auction on Feb. 23 and brought fairly good prices.

New York

NEW YORK, March 1.

MACHINE tool buying continues on a moderate scale. Inquiries outnumber orders. There is little or no increase of plant facilities and the machine tools being bought are almost entirely for replacements. Among the orders of the week are the following: Delaware & Hudson Railroad, two 48-in. carwheel borers; Baltimore & Ohio Railroad, 20-in. vertical drilling machine; a Pittsburgh foundry company, 7-ft. radial drill and a 42-in. x 32-ft. lathe; a Chicago manufacturer of agricultural machinery, 26-in. vertical drilling machine; a Marquette, Mich., manufacturer, a vertical slotter; a New Jersey motor truck manufacturer, a horizontal boring and drilling machine; an engine manufacturer at Cos Cob, Conn., a vertical surface grinder; a company at Waterbury, Conn., a jig borer; a New Haven, Conn., lock manufacturer, a universal bench milling machine; a Wellesley Hills, Mass., manufacturer, a die sinking machine; a York, Pa., company, an automatic lathe and a duplex centering machine; the Blaw-Knox Co., Blaw Knox, Pa., a vertical surface grinder; a gear manufacturer in Chicago, a 10-in. x 60-in. thread milling machine.

The Park Central Motors Co., 247 Park Avenue, New York, has leased a new six-story building on East 102nd Street, near Fifth Avenue, for a service, repair and garage branch, and will take possession soon. It is purposed to construct two additional floors.

The I. B. Kleinert Rubber Co., 485 Fifth Avenue, New York, has awarded a general contract to George Jeuch, College Point, L. I., for a new three-story plant, 100 x 125 ft., at North Fifth Avenue and Eighteenth Street, College Point, to cost in excess of $80,000 with equipment. Daniel Campbell, 154 Amity Street, Flushing, L. I., is architect.

The Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of industrial oxygen, welding apparatus, etc., is said to be planning the early construction of a new branch plant at Duluth, Minn., where a 10-acre tract recently has been acquired by the Union Carbide & Carbon Corporation, parent organization. The Prest-O-Lite Co., same address, also a subsidiary of the Union company, manufacturer of acetylene welding equipment, etc., plans the erection of a new plant on adjoining site. Both factories are scheduled for construction early in May, and are reported to cost more than $400,000 with machinery.

Parker & Shaffer, 280 Madison Avenue, New York, architects, have asked bids on a general contract for a ten-story automobile service, repair and garage building, 100 x 125 ft., to cost approximately $500,000 with equipment.

In connection with a new plant at 110 Bridge Street, Brooklyn, the Eskimo Pie Corporation, Louisville, plans to use a portion of the five-story structure, recently purchased, for assembling electric refrigerated coin-vending machines and for electrically-operated refrigerating equipment for domestic service. It is purposed to have the factory ready for service in about 60 days. A subsidiary organization, to be known as the New York Eskimo Pie Corporation, has been formed to operate the local plant.

The White Motor Co., Cleveland, manufacturer of motor trucks, has filed plans for its proposed factory branch and service plant on Cypress Avenue, New York, to be two stories, 150 x 200 ft., estimated to cost $250,000 with equipment.

The Rutan-Duffy Auto Co., 46 Front Street, Port Jervis, N. Y., will soon ask bids on a general contract for a new three-story service, repair and garage building, 35 x 100 ft., to cost about $65,000. F. B. Raymond, Pennsylvania Avenue, is architect.

The New York Telephone Co., 140 West Street, New York, plans the construction of a power plant in connection with a new station at White Plains, N. Y., reported to cost in excess of $100,000.

The Gould Mersereau Co., 52 West Thirty-eighth Street, New York, manufacturer of metallic bindings, etc., has taken out a permit for a new twelve-story building at 189-91 Lexington Avenue, a portion of the structure to be equipped as a factory. It will cost $300,000. R. C. P. Boehler, 116 West Thirty-ninth Street, is architect.

The Associated Gas & Electric Co., 61 Broadway, New York, has arranged for a stock issue to total $4,050,000, a portion of the proceeds to be used for extensions and improvements in plants and systems, including the acquisition of additional properties. J. I. Mange is president.

The Western Electric Co., 195 Broadway, New York, has filed plans for three multi-story additions to its plant at Kearny, N. J., to cost $1,350,000 with equipment.

The National Oil Products Co., Essex Street, Harrison, N. J., has plans for a three-story addition, 35 x 40 ft., to cost about $65,000 with equipment. Joseph Kennedy, 417 Kearny Avenue, Kearny, N. J., is architect.

The Board of Sewer Commissioners, Freeport, L. I., is asking bids until March 14 for motor-driven pumping equipment, screens, etc., for a sewage treatment plant and pumping station. Nicholas S. Hill, Jr., 112 East Nineteenth Street, New York, is consulting engineer.

The Central Railroad of New Jersey, 143 Liberty Street, New York, has filed plans for a new one-story repair shop at its terminal at Elizabethport, N. J., to cost about $19,000.

The United States Electrical Tool Co., Cincinnati, has moved its service quarters in New York City from 96 Church Street to 50 Dey Street, where it has larger space for the carrying of stock and repair parts. W. B. Da Silva, 50 Church Street, is New York manager.

The American Lead Pencil Co., 500 Willow Avenue, Hoboken, N. J., is preparing plans for a new seven-story factory, but has not yet issued a formal call for bids on the general contract, as was incorrectly reported last week.

The Ajax Oil Burner Corporation, 42 Lawrence Street, Newark, has been incorporated with 10,000 shares of no par common stock to manufacture automatic domestic oil burners. It is in the market for pipe, castings, bolts and screws, tanks, pumps and various sorts of electrical equipment.

The Chromium Corporation of America has removed its general offices from 26 Broadway to 120 Broadway, New York.

The Brunswick Metal Novelty Co., New Brunswick, N. J., has been organized with a capital stock of $50,000 to manufacture metal specialties. The company may be reached in care of Phillip M. Brenner, New Brunswick.

Hendricks & Class, 30 Church Street, who have been specialists in the sale of chain for many years, have been appointed district sales agents in the New York territory by the Carroll Chain Co., Columbus, Ohio. They will continue to handle the same grades and sizes of chain that they have handled in the past.

The Chateaugay Ore & Iron Co., Standish, N. Y., has plans for the construction of a new one-story plant for the production of steel car wheels. It is reported to cost in excess of $50,000 with equipment, and is scheduled to be ready for operation early in May.

New England

BOSTON, Feb. 28.

FEBRUARY closed with a somewhat more optimistic feeling in local machine tool circles, although buying is still largely confined to single machines and companies negotiating with machinery dealers for new equipment are slow in making the necessary appropriations. While business in the last few days was spotty, it was better than in the two preceding weeks. Among sales of new tools were a 6-in. vertical shaper to a New Hampshire firm; a 12-in. vertical shaper to a Worcester shop; 16-in. lathe to a Connecticut company; two fairly large bench lathes to a Connecticut clock-making plant; 13-in. lathe to an experimental shop; 36 x 44-in. side head boring mill and three electric floor grinding machines to a railroad shop, and a small grinder to an electrical apparatus making plant. A 15-in. x 6-ft. lathe, an upright drill and a hack saw to a Lawrence manufacturer; a large lathe to a Vermont plant and a No. 20 Bliss press to a local shop were among the used tools sold the past week.

Small tools are selling well. February shipments were in excess of those for the corresponding month last year.

Heretofore the General Electric Co., in purchasing at least some machine tools, has stipulated that the company would furnish motors, controls, switches, etc., and that such apparatus would be assembled on the tools at its Lynn, Mass., plant. The company now gives local machine tool dealers to understand that such equipment will be sent to the makers of machine tools to be assembled by them, so that when the equipment arrives at Lynn it will be complete. The machine tool trade here feels this will greatly simplify matters.

Plans are in progress for rebuilding the plant of the Emerson Mfg. Co., Lawrence, Mass., paper machinery, recently destroyed by fire.

Work has started on repairing the damage recently caused by fire at the plant of the Wakefield Steel Wrench Co., Inc., 89 Exchange Street, Worcester, Mass. Plans are private.

John M. Gray, 175 High Street, Boston, architect, is preparing plans for a one-story, 60 x 100 ft., and three-story, 70 x 120 ft., high school addition at Salem, Mass., to contain manual training departments.

The Philbrick-Booth Foundry Co., Homestead Avenue, Hartford, Conn., has awarded contract for a two-story, 60 x 65 ft. foundry addition. New equipment will include a crane. Mylchreest & Reynolds, 238 Palm Street, Hartford, are the architects.

F. P. Sheldon & Son, 1009 Hospital Trust Building, Providence, R. I., architects, are taking bids on a two and one-half story, 51 x 68 ft., machine shop addition for Henry Scott & Son, Blackstone Street, Providence.

The Wico Electric Co., West Springfield, Mass., has tentative plans for a new unit that will double the manufacturing capacity. The company last year opened a plant in England.

C. H. Tenney & Co., 200 Devonshire Street, Boston, engineers, have plans for an electric generating station on the waterfront at Salem, Mass. The plant will transmit electric power and light by high tension lines to Haverhill and Newburyport, Mass. Present stations in Haverhill and Newburyport will be continued as auxiliary plants, and substations will be erected in towns between Salem and North Andover and between Danvers and Haverhill, Mass.

The General Machinery Corporation, machine tool merchant, 170 Summer Street, Boston, has been appointed New England representative, with the exception of the State of Connecticut, for automatic drill pointers, point thinning machines, die filing machines, radial profiling machines, inserted tooth milling cutter grinding machines of the Oliver Instrument Co., Adrian, Mich., and for Schuchardt & Schutte gear hobbing machines and other products.

Contract has been let by the City Hall Hardware Co., 150 Washington Street, Providence, R. I., to the Balchin Construction Corporation, 75 Westminster Street, for a four-story storage and distributing plant, 96 x 100 ft., to cost about $225,000. Thomas J. Pierce, 275 Washington Street, is architect. Max Siegal is one of the heads of the company.

The Citizens' Gas, Electric & Power Co., 56 Main Street, Nantucket, Mass., has plans under way for an addition to its power plant to cost in excess of $45,000 with equipment.

The West Rock Wagon & Auto Works, Westville, Conn., is considering the early rebuilding of the portion of its plant destroyed by fire Feb. 20, with loss estimated in excess of $75,000 with equipment.

The A. C. Gilbert Co., 493 Batchley Avenue, New Haven, Conn., manufacturer of mechanical toys, electric fans, etc., has awarded a general contract to the Immick Co., Meriden, Conn., for a two-story and basement addition, 62 x 85 ft. Lockwood, Greene & Co., 24 Federal Street, Boston, are architects and engineers.

F. N. Tilton, Hartford, Conn., interested in a project to construct a two-story automobile service, repair and garage building to cost approximately $100,000, is president of the Atlantic Screw Co., 85 Charter Oak Avenue, and is not connected with another company in this line of production, as noted, erroneously, in a recent report in these columns.

Charles Mattson, Fitchburg, Mass., has secured property at 359 Mechanic Street, and will operate a factory for the production of a standardized beveled steel cutting rule for folding paper box cutting machines, and kindred specialties.

Homer Judd, 206 West Street, Bristol, Conn., has plans for a new one-story plant, 37 x 170 ft., for automobile service, to include body-building department, forge and blacksmith shop, and general service and repair department.

The Commonwealth Ice & Cold Storage Co., Fish Pier, Boston, is arranging for the early construction of its new cold storage and refrigerating plant, for which bids are being taken on a general contract. It is reported to cost in excess of $75,000 with equipment.

Philadelphia

PHILADELPHIA, Feb. 28.

MOTORS, elevating and conveying machinery and other equipment will be installed in the new plant to be erected by the George F. Lasher Printing Co., 147 North Tenth Street, Philadelphia, to cost $700,000. A general contract has been let to the Turner Construction Co.

The Federal Auto Radiator Co., Philadelphia, has leased the entire building at 1344-48 Poplar Street for manufacturing and repair work.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has concluded arrangements with the Pennsylvania Power & Light Co., Allentown, Pa., for an interchange of power, the expansion to include the construction of a steel tower transmission line to the Siegfried substation of the last noted company. Connection will be made with a similar steel tower line with the new hydroelectric generating plant of the Philadelphia company to be constructed at Conowingo, on the Pennsylvania-Maryland State line, at a cost of more than $20,000,000. The Pennsylvania Power & Light Co. will extend its generating facilities.

The Board of Education, Keystone Building, Philadelphia, plans the installation of manual training equipment in the proposed Shallcross school for boys, for which bids have been asked on a general contract. It is reported to cost in excess of $250,000. Irwin T. Catherine, Keystone Building, is architect.

D. B. Flower, 1217 Spring Garden Street, Philadelphia, railroad equipment and supplies, has plans for a new one-story factory, 45 x 150 ft., at Morrisville, Pa., to cost $30,000 with equipment. Thomas B. Stockham, Stockham Building, Morrisville, is architect.

The Harrisburg Mfg. & Boiler Co., Harrisburg, Pa., is said to be planning to rebuild the portion of its plant destroyed by fire Feb. 23, with loss reported in excess of $50,000 including equipment. The damage was confined largely to the automotive division.

The Crane Market

THERE is a good volume of inquiry in the market for both electric overhead and locomotive cranes, but purchasers are still slow to place business. One of the largest purchases recently was the award by the York Mfg. Co., York, Pa., of 11 electric cranes. Among current inquiries for locomotive cranes is one for the Boston & Maine Railroad and several for the Canadian National Railways.

Among recent purchases are:

Loizeaux Builders Supply Co., Elizabeth, N. J., a 25-ton, 8-wheel locomotive crane from the Browning Crane Co.

Board of Harbor Commissioners, Wilmington, Del., a 25-ton, 8-wheel locomotive crane from the Ohio Locomotive Crane Co.

General Engineering & Management Corporation, 165 Broadway, New York, three 8-ton electric traveling cranes from the Euclid Crane & Hoist Co.

Andes Copper Mining Co., 25 Broadway, New York, several hand power cranes including one of 10 tons capacity, from the Euclid Crane & Hoist Co.

Public Service Production Co., Newark, N. J., a 10-ton, 38-ft. span hand power crane from the Box Crane & Hoist Corporation.

West Virginia Rail Co., Huntington, W. Va., a 5-ton, 65-ft. span overhead crane from the Cleveland Crane & Engineering Co.

York Mfg. Co., York, Pa., eleven 20-ton and 30-ton overhead traveling cranes from the Niles Crane Corporation.

International Paper Co., 100 East Forty-second Street, New York, a 15-ton hand power crane for shipment to Maine from an unnamed seller.

The V. H. Steckel Motors Co., 302 South West Street, Allentown, Pa., will take bids soon on a general contract for a one-story and basement service, repair and garage building to cost $100,000 with equipment. V. H. Steckel is head.

The Valley Forge Cement Co., Catasauqua, Pa., recently formed by J. W. Fuller, Catasauqua, and associates, has filed plans for a group of 13 buildings for its proposed new mill at West Conshohocken, Pa. Work on initial units will begin at once. The plant will be equipped for a capacity of 2500 bbl. per day, and is estimated to cost in excess of $1,000,000.

The Myers Accessory Co., Cameron and Mulberry Streets, Harrisburg, Pa., has plans under way for a two-story and basement addition to its service, repair and garage building, 45 x 80 ft., to cost about $50,000. George W. Myers is head.

The Board of School Trustees, Unionville, Pa., has received an appropriation of $160,000 for an addition to the local consolidated and vocational school. Plans will be drawn soon.

The Autocar Co., Ardmore, Pa., has discontinued the production of electrically operated trucks and will devote production in the future to gasoline-propelled trucks of 1½-ton and larger capacities. Robert P. Page, Jr., has been elected president to succeed L. L. Woodward, recently deceased.

The M. L. Shoemaker Co., Inc., Delaware Avenue and Venango Street, Philadelphia, manufacturer of fertilizer products, will rebuild the portion of its plant damaged by fire Feb. 22, with loss in excess of $45,000 including equipment.

The H. K. Ferguson Co., 4900 Euclid Avenue, Cleveland, has been awarded contract for the erection of new car repair shops for the Wilkes-Barre Railway Corporation, Wilkes-Barre, Pa., of which William T. Bell is vice-president and general manager. The buildings will include a machine shop, 121 x 201 ft., and a carpenter shop, 121 x 151 ft., both one story, with basement. The estimated cost is $250,000.

The Bertrin Petroleum Co. has been organized with a capital stock of $1,000,000 as a subsidiary of the General Asphalt Co., 1600 Arch Street, Philadelphia, to operate a cracking unit under construction at the plant of the Barber Asphalt Co., Maurer, N. J. The unit is being built by M. W. Kellogg & Co., 7 Dey Street, New York. The Bertrin company will be in the market for a small amount of equipment.

The Pusey & Jones Corporation, Wilmington, Del., has been formed to take over all assets of the Pusey & Jones Co., shipbuilder and manufacturer of paper mill machinery. There has been no change in management or personnel.

The Electrical Coil Winding Co., Camden, N. J., has been incorporated with a capital stock of $50,000 to manufacture electric coils for electrical equipment, medical apparatus, time clocks and other automatic machinery. The company plans to erect a factory, and is in the market from time to time for glassine paper, insulated copper wire, cotton thread and insulating materials.

The Pottstown Metal Products Co., Inc., Pottstown, Pa., has been organized to manufacture riveted and welded steel tanks and stacks and fabricate steel plate products. It is building a new shop at Pottstown and expects to begin manufacturing in April.

South Atlantic States

BALTIMORE, Feb. 28.

PLANS have been approved by the Standard Lime & Stone Co., Equitable Building, Baltimore, for a new cement mill at Martinsburg, W. Va., on which work will proceed at once. The initial unit will be of one-kiln type, with proposed expansion later.

The Zihlman Glass Co., Cumberland, Md., recently organized by Albert E. Zihlman and James J. Kirk, both of Cumberland, with capital of $75,000, has acquired a local site for the immediate erection of a new plant for the manufacture of general glassware. The factory will be equipped with a continuous tank and accessories, and all equipment will be electrically-operated. It is reported to cost in excess of $60,000.

The Taylor-Parker Co., Inc., Water Street, Norfolk, Va., is in the market for two 8-wheel, standard gage locomotive cranes, each 15 tons capacity.

The Ninety Six Cotton Mills, Inc., Ninety Six, S. C., has approved plans for an addition to its power plant, including turbine-generating and boiler departments, reported to cost about $45,000 with equipment. J. E. Sirrine & Co., Greenville, S. C., are engineers.

The Department of Public Works, Winston-Salem, N. C., has plans for a new municipal garage and service building, to include an automobile and motor truck repair works, machine shop and wood-working shop. It will cost about $150,000. R. A. Thomas is city engineer.

Fire, Feb. 19, destroyed a portion of the No. 2 plant of the Statesville Furniture Co., Statesville, N. C., with loss reported at close to $275,000 including machinery.

H. B. Knox, Winston-Salem, N. C., is at the head of a project to establish a local plant for the production of spokes for automobile wheels. Inquiries are being made for wood-turning machinery and other equipment.

The Poole Engineering & Machine Co., Woodberry, Baltimore, has purchased a controlling interest in the Earnshaw Mfg. Co., Camden, N. J., manufacturer of electric refrigerating equipment, etc., and plans the early removal of the business to Woodberry where a building will be given over to the new unit. The production of refrigerating apparatus will be continued.

The Robbins-Buick Co., 21 East North Avenue, Baltimore, local representative for the Buick automobile, will take bids early in March on revised plans for a two-story service, repair and garage building, 90 x 100 ft., to cost $65,000 with equipment. W. S. Austin, Maryland Trust Building, is architect.

The Georgia Commission Co., Booker Street, Albany, Ga., has filed plans for a new cold storage and refrigerating plant, to cost about $40,000 with equipment. Sidney Sterne is head.

The Southern Railway Co., Pennsylvania Avenue, Washington, is said to be planning the construction of a new engine terminal, with repair shop and facilities, at Durham, N.C., in connection with a new classification yard at that point. The entire project will cost in excess of $100,000. H. W. Miller is vice-president, in charge.

The Appomattox Box Shook Co., Petersburg, Va., is said to be arranging to rebuild the portion of its plant destroyed by fire Feb. 22, with loss reported at close to $100,000 with machinery.

The Falling Spring Lime Co., Inc., Barber, Va., Guy G. Buell, general manager, recently organized, is arranging for the early installation of a new lime plant with capacity of about 400 tons of rock per day; to be increased to 1000 tons later. All machinery will be electrically-operated. The company will develop quarry property in this section.

The Savannah Electric & Power Co., Savannah, Ga., is said to be planning the early installation of a new electric light and power plant in the vicinity of Tybee, Ga., to cost more than $30,000 with equipment.

The Home Ice Co., Rosslyn, Va., operated by F. J. Hughes, is reported to have plans under way for a new plant to cost in excess of $100,000 with equipment. It will replace the works of the Rosslyn Packing Co., recently destroyed by fire.

The Hackley-Morrison Co., 204 North Jefferson Street, Richmond, Va., machinery dealer, is making inquiries for a 24-in. upright drill press, and a 150-hp. stationary engine, Corliss type.

Pittsburgh

PITTSBURGH, Feb. 28.

A MORE satisfactory business is reported in machine tools for the past week than in any previous week this year. Sales run chiefly to single items, but have lately increased and many firms are adding to their prospective business either through direct inquiries or by developing requirements among users. The Lorain Steel Co., Johnstown, Pa., has bought an 18-in. lathe. The Standard Seamless Tube Co., Economy, Pa., has covered on the tools required to replace those recently destroyed by fire.

The Guarantee Liquid Measure Co., Rochester, Pa., has asked bids on a general contract for additions to its plant, including power house, to cost about $125,000 with equipment.

The West Virginia Power & Transmission Co., West Penn Building, Pittsburgh, has tentative plans for two hydroelectric power projects on the Cheat River in the vicinity of Morgantown, W. Va., to develop capacities of 60,000 hp. and 48,000 hp., respectively. Transmission lines will be built. The entire project is reported to cost more than $5,000,000.

The Kittanning Plate Glass Co., Peoples' Bank Building, Pittsburgh, has plans under way for four one-story units, to its plant at Kittanning, Pa., to cost more than $1,250,000 with machinery. It is expected to begin work in the spring. The H. L. Dixon Co., Rosslyn Street, Carnegie, Pa., is engineer and contractor.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for a lifting magnet, electrically-operated, 220-volt, d.c.; also for a number of motors, from 2 to 20 hp., including three 15-hp. squirrel cage motors.

Fire, Feb. 18, destroyed a portion of the plant of the Paul Wissmach Glass Co., Inc., Paden City, W. Va., manufacturer of wire glass, etc., with loss estimated at close to $100,000 including equipment. Plans for rebuilding are under consideration.

The West Virginia Power Co., Charleston, W. Va., is reported to have plans under way for a hydroelectric power plant on the New River, vicinity of Huntington, W. Va., with initial capacity of about 12,000 hp. Viele, Blackwell & Buck, 49 Wall Street, New York, are consulting engineers.

The Armstrong Cork Co., Twenty-fourth Street, Pittsburgh, manufacturer of insulating board for refrigerating service, etc., will soon begin the construction of a one-story addition, 60 x 120 ft., to its plant at Beaver Falls, Pa., to cost $75,000.

Buffalo

BUFFALO, Feb. 28.

PLANS are under way for a one-story addition to the plant of the United States Radiator Corporation, Dunkirk, N. Y., to cost more than $50,000 with equipment. Headquarters are at 133 East Grand River Avenue, Detroit.

Conrad & Cummings, Phelps Building, Binghamton, N. Y., architects, have plans under way for a one-story and basement automobile service, repair and garage building to cost in excess of $60,000 with equipment.

The International Agricultural Corporation, Mutual Life Building, Buffalo, is planning to purchase a steam-electric generating set, turbine type, generator direct-connected to exciter, to develop 50 to 100 kva., for installation at its new plant at Wales, Tenn. The plant will be devoted to fertilizer manufacture and will cost about $150,000 with equipment.

William Laidlaw, Inc., Belmont, N. Y., manufacturer of pulverizing machinery, band saws, etc., is said to be planning the erection of a one-story addition, to cost close to $30,000 with equipment.

The Gas-Gard Co., 375 Main Street East, Rochester, N. Y., has been incorporated with a capital stock of $30,000 to manufacture gas valves and kindred products, particularly the Gas-Gard heater control system, and will soon have a plant in operation.

The Board of Education, Alexandria Bay, N. Y., is considering the installation of manual training equipment in its proposed two-story and basement high school to cost $250,000, for which plans have been drawn by A. F. Gilbert, 358 Fifth Avenue, New York, architect.

Detroit

DETROIT, Feb. 28.

THE Michigan Foundry & Machine Co., Kalamazoo, Mich., recently organized, has leased local property and will begin operations at an early date. G. W. Mockly is president, and Conrad Schopp, secretary and treasurer.

The Ford Motor Co., Detroit, is said to be planning for extensions in its assembling plant at Denver, Colo., to increase the working force from 450 to 650 men. A department will be installed, also for the manufacture of closed bodies.

The Consumers Power Co., Jackson, Mich., has arranged for an expansion and improvement program to cost about $15,000,000. The work will include the construction of an addition to the steam-operated electric power plant at Zilwaukee, Mich. The power substation at Pontiac, Mich., will be enlarged and at Bay City and vicinity, a fund of more than $2,000,000 will be expended, including enlargement of the steam-operated electric generating station on the Saginaw River. A steel tower transmission line will be built from Lansing to Jackson. The Kalamazoo steam-operated power plant will be completed during the year. A new automatic power substation will be constructed at Ionia, and substations of this type will be built also at other places.

The Macklin Co., Jackson, Mich., recently organized with a capital of $250,000 to manufacture grinding wheels and other abrasive products, has plans for the immediate erection of the first unit of a new plant to cost about $45,000 with equipment. T. J. McIntyre is president and B. F. McIntyre, vice-president; the first noted previously was connected with the Carborundum Co., Niagara Falls, N. Y., and the second, with the Waltham Grinding Wheel Co., Waltham, Mass. C. H. Franklin is secretary and treasurer, and Carl H. Lawson, engineer.

The American Wire Cloth Co., Kalamazoo, Mich., recently formed with a capital of $25,000, has leased local property for the production of screens for paper mill service and other paper machinery specialties. Operations will begin soon. Frank F. Schmeige is president and George Shinners, secretary and treasurer.

The Detroit Edison Co., 2000 Second Avenue, Detroit, is arranging an expansion program to cost $28,000,000. Of this amount, a fund will be devoted to extensions in power plants and installation of additional machinery. About $4,000,000 will be expended for power substations and equipment, and close to $8,000,000 for transmission and distributing lines.

The Almont Mfg. Co., Imlay City, Mich., manufacturer of automotive products, has leased the former plant of the Imlay City Foundry Co. for an addition. The present factory will be maintained as heretofore.

The Nichols & Shepard Co., Battle Creek, Mich., manufacturer of grain threshing machinery and parts, is disposing of a note issue of $2,000,000, a portion of the proceeds to be used for expansion in production. Lewis J. Brown is vice-president.

The Clark Electric Co., 10756 Jefferson Avenue West, River Rouge, Mich., has been organized with a capital stock of $100,000 to manufacture electrical specialties.

The Herman Miller Clock Co., Zeeland, Mich., has been organized with a capital stock of $150,000 to manufacture clocks. A plant has been built and equipped.

The AC Spark Plug Co., Flint, Mich., will erect a new warehouse, 100 x 420 ft., adjacent to its east side plant, thereby releasing for production purposes the space now used for storing materials and supplies.

The Palmer-Bee Co. has completed plans for the erection of a machine shop, steel shop, warehouse and offices at Poland and Dyar Streets, Detroit. The machine shop is now under construction. It will have 24,000 sq. ft. of space and will be ready for occupancy about May 1. The steel shop will have 30,500 sq. ft. and will be erected as soon as the machine shop is completed. The office and warehouse

building will be two stories, with 24,000 sq. ft. of space on each floor, the second floor being used for offices. There will be two outdoor craneways, one 62 ft. wide with a runway 210 ft. long, the other craneway 47 ft. wide and 210 ft. long. The buildings exclusive of equipment will cost $300,000. Including equipping, the plant is expected to be finished by July 1. At that time the company will move out of the present plant at 2778 East Grand Boulevard.

Cleveland

CLEVELAND, Feb. 28.

THE machine tool market is still very dull. Orders are limited to single machines and only a few were placed during the week. Inquiries are also light, and the outlook for an early improvement is not bright. February as a whole was disappointing, as the aggregate business fell considerably below January. Detroit reports a marked improvement in demand for small tools, due to the better operating conditions in the automotive industry, but very little new machine tool business is coming from that source.

The machinery equipment of the National Motor Car & Vehicle Corporation, Indianapolis, Ind., was sold at auction Feb. 23. It consisted of about 300 tools, including 40 lathes, 20 of which were turret lathes, screw machines, 30 milling machines, 60 grinding and 60 drilling machines. It is stated that a considerable portion of the machine tools were bought by users and brought fair prices.

The Griscom-Russell Co., Massillon, manufacturer of heating apparatus, plans the erection of a one-story factory addition.

The Willys-Overland Co., Toledo, Ohio, is said to have selected property at Los Angeles for a new Pacific Coast plant, to be devoted primarily to assembling. Several one-story buildings will be erected to cost in excess of $1,000,000 with machinery.

The Ohio Power Co., Canton, Ohio, is arranging for the immediate erection of a new unit at its power plant on the Muskingum River at Philo, Ohio, to cost in excess of $10,000,000 with machinery and transmission system.

The Ohio Bell Telephone Co., 4300 Euclid Avenue, Cleveland, has plans for a one-story automobile service, repair and garage building, 60 x 220 ft., for company cars and trucks, to cost $100,000 with equipment.

The National Tire & Rubber Co., East Palestine, Ohio, has plans for a new two-story mill, 45 x 120 ft., to cost close to $50,000 with equipment.

The Board of Education, Dennison, Ohio, is said to be planning the installation of manual training equipment in its proposed new high school, to cost $250,000, for which bids have been asked on a general contract. J. Kerr Giffen, First National Bank Building, Canton, Ohio, is architect.

C. G. Mitchell, Hamilton, Ohio, municipal service director, is considering the installation of a new high-power centrifugal pumping unit at the waterworks, to cost about $24,000.

Chicago

CHICAGO, Feb. 28.

OPINION as to the trend of the machine tool market is at variance. Dealers who have fair lists of inquiries of long standing report that sales are up for the week but those relying for business from new sources find the market dull. February sales are on a level with January, but there is little doubt that the volume of business in sight has steadily grown smaller. One dealer reports sales of a 48-in. x 16-ft. lathe, a 34-in. planer, a 34-in. vertical boring mill, a 6-ft. radial drill and a lapping machine. A fair demand exists for medium and large sized rebuilt machine-tools.

The Illinois Steel Co's. list appears more active than a week ago and the Union Pacific is preparing a list which may come out late in March. The Chicago & Eastern Illinois is in this market for an axle lathe and two carwheel borers.

The Glass Novelty Co., 4402 West Twenty-sixth Street, Chicago, manufacturer of juvenile furniture, will build a factory, 110 x 165 ft., to cost $65,000. B. Kurzon, 30 North Dearborn Street, is architect.

The Chicago Granite & Marble Co., 4920 South Rockwell Street, Chicago, will build a one-story brick factory, 126 x 201 ft., to cost $48,000. F. B. Jorgenson, 160 North LaSalle Street, is architect.

The Commonwealth Steel Co., Granite City, Ill., will build a foundry 100 x 600 ft. This, with other improvements, will cost about $1,000,000.

The Douthett Engineering Co., 139 North Clark Street, Chicago, manufacturer of drying systems, will build a two-story brick factory, 30 x 100 ft., to cost $18,000. S. Kehl, 1225 North Maplewood Avenue, is the general contractor.

The Chicago, Rock Island & Pacific Railroad, La Salle Street Station, Chicago, plans the installation of new water-treating plants at Armourdale and Marion, Kan., and at Shawnee, Okla.

The City Council, Galesburg, Ill., will ask bids in April for equipment for a municipal water plant, including a new pumping station. Pease, Greeley & Hansen, 6 North Michigan Avenue, Chicago, are engineers.

The construction division, Veterans' Bureau, Washington, will receive bids until March 8 for an elevated steel tank, of 108,000 gal. capacity, for erection at Maywood, Ill.

The Rexpulp Co., Inc., 37 West Van Buren Street, Chicago, has been organized to manufacture improved pulp molding machinery, and plans to build a factory during the summer.

The George D. Roper Corporation, South Main Street, Rockford, Ill., manufacturer of pumps, enameled iron products, etc., is completing plans for the construction of a one-story addition, 170 x 170 ft., and a one-story power plant, 38 x 80 ft. The entire project will cost $250,000 with equipment. It is expected to begin work in April.

Joseph Ludgin, 310 South Michigan Avenue, Chicago, architect, has plans in progress for a two-story and basement automobile service, repair and garage building, 100 x 125 ft., to cost $100,000 with equipment.

The Kewanee Boiler Co., Kewanee, Ill., will proceed with the construction of a one-story addition, 80 x 200 ft., to be equipped for a flange shop. General contract recently was let to the Worden-Allen Co., 208 South La Salle Street, Chicago. It is estimated to cost in excess of $75,000 with equipment. M. F. Moore is general manager.

The Chicago Solder Co., 4201 Wrightwood Avenue, Chicago, has awarded a general contract to the Schmidt Brothers Construction Co., 22 East Huron Street, for a one-story addition, to cost approximately $55,000 with equipment.

The City Council, Iowa City, Iowa, is planning the purchase of a low pressure engine unit and pumping equipment in connection with proposed extensions and improvements in the municipal waterworks. The entire project will cost about $75,000. George H. Dohrer is city clerk.

The United States Bureau of Reclamation, Denver, Colo., will receive bids until March 15 for one hydraulic turbine, with capacity of 3400 hp. when operating under a head of 65 ft.; one 3000-kva. electric generator; three 1000-kva. transformers; 37,000-volt oil circuit breaker and auxiliary equipment, for the Guernsey power plant, North Platte project, Nebraska-Wyoming, as per specifications at office noted.

The Western Steel Corporation, Brighton, Colo., care of the Brighton Commercial Club, now being organized by local interests, has preliminary plans for the construction of a local plant for the manufacture of iron and steel products, to cost close to $100,000 with equipment.

The Pueblo Airport, Pueblo, Colo., Capt. J. H. Cordner, in charge, has plans under way for the construction of a new airplane manufacturing plant, including parts and assembling divisions, to cost close to $125,000 with equipment.

The Universal Power Supply Co., Chicago, recently organized, has leased space in the building at 1113-19 North Franklin Street, for the manufacture of radio equipment.

The Campbell Machine Co., 607 Fifth Avenue, South, Minneapolis, Minn., will soon begin the construction of a one-story and basement machine shop, 80 x 100 ft., to cost about $24,000 with equipment. S. B. Appleton, 5329 Grand Avenue, is architect.

Milwaukee

MILWAUKEE, Feb. 28.

WHILE the volume of machine-tool sales by local builders during February fell somewhat below the aggregate of a year ago, the industry is entering March with promising prospects. A feature of the past week was improved inquiry from the automotive industries, which are expected to be more prominent factors in the market from now on. Scattering sales are reported to railroads, and general industrial shops are placing orders for one or two items, mostly for replacement.

The Milwaukee Power Lawn Mower Co. has been incorporated with a capital stock of $25,000 to manufacture gasoline engines, power lawn mowers, clippers, and to do a general

machine shop business. The principals are John C. Sloneger, Norbert C. Schultz and William F. Tannhaeuser, who is the president and treasurer of the Mar-Tan Motor Mfg. Co., 837-841 Twenty-ninth Street, Milwaukee, which for the present will handle production.

Morris Brothers, 20 East Sibley Street, Fond du Lac, Wis., manufacturers of brass and aluminum castings, have acquired the former Huber Drug Mills at Marquette and East Sibley Streets, and will expend between $20,000 and $30,000 in remodeling for a plant addition. The L. F. Schroeder Construction Co., local, has the general contract and is starting work March 1.

The Ideal Body Co., 506 South Park Street, Madison, Wis., manufacturer of automobile bodies, cabs, etc., will start work on the erection of an addition, 80 x 100 ft., part two stories, costing about $35,000. The proprietors are Joseph Dotti and R. F. Quast.

The Kewaskum Aluminum Co., Kewaskum, Wis., manufacturer of aluminum utensils, novelties and specialties, expects to break ground March 15 for the construction of a two-story brick and concrete addition, 50 x 100 ft., estimated to cost $40,000 with equipment.

The Racine Universal Motor Co., Bridge and Ontario Streets, Racine, Wis., is taking bids through J. Mandor Matson, local architect, for the construction of its new plant at Gold Street and the Chicago & North Western right of way. It will be 60 x 250 ft., two and three stories, and cost about $75,000 without equipment.

Gill Brothers, Madison, Wis., have awarded contracts for the erection of two additional stories on their present automotive sales and service building, 66 x 264 and 44 x 132 ft., at East Washington Avenue and Webster Streets, costing about $75,000. The architects are Claude & Starck, Madison.

The Board of Education, Sault Ste. Marie, Mich., is entering the market for the equipment of a $100,000 manual training school now nearing completion. Bids also will be taken after March 8 for the construction of a $300,000 junior high school. Both projects are in charge of John D. Chubb, architect, 109 North Dearborn Street, Chicago. C. G. Clarke is secretary of the board.

The Wisconsin Gas & Electric Co., Racine, Wis., has plans under way to double the capacity of its gas plant at an estimated cost of $500,000. It also contemplates an expenditure of more than $2,000,000 on other properties this year.

St. Louis

ST. LOUIS, Feb. 28.

The Missouri Pacific Railway has issued the following list of machine tools for its various shops as noted:

Sedalia, Mo.
Two spindle rod boring machines.
No. 5 plain milling machine.
10-in. x 36-in. universal grinder (for scale shop).
24-in. engine lathe.
16-in. splitting shears.
36-in. gap spot welding machine.
No. 1 angle iron bending rolls.

North Little Rock, Ark.
15-ton electric traveling crane.
Squaring shears.
5-ft. radial drill.
48-in. vertical drill.
No. 5 plain milling machine.
36-in. draw-cut shaper.
13-in. universal punch and shear.
42-in. engine lathe—9-ft. center.
20-in. slotter.
Fordson tractor with boom.

Kansas City, Mo.
Geometric chaser grinder.
Sensitive drill.
10-in. x 36-in. universal grinder.
48-in. vertical drill.
Fordson tractor with boom.
36-in. draw-cut shaper.

Osawatomie, Kan.
20-in. engine lathe.
42-in. vertical drill press.
Fordson tractor.

Falls City, Neb.
20-in. engine lathe.

Omaha, Neb.
Double grinder.
32-in. crank shaper.

St. Louis
90-in. driving wheel lathe.

Alexandria, La.
Distributing valve test rack.

A permit has been taken out by the Galion Iron Works & Mfg. Co., Galion, Ohio, for its one and two-story factory branch and distributing plant at Kansas City, Mo., 90 x 110 ft., to cost $70,000 with equipment.

The St. Louis Refrigerating & Cold Storage Co., St. Louis, has arranged for a bond issue of $1,000,000, a portion of the proceeds to be used for expansion and betterments. Robert McK. Jones is president.

The Butler Mfg. Co., 1324 Grand Avenue, Kansas City, Mo., manufacturer of sheet steel products, has filed plans for a one-story addition, 76 x 204 ft., to cost $22,000. C. E. King, 7400 East Thirteenth Street, is engineer.

The Century Electric Co., 1806 Pine Street, St. Louis, manufacturer of electric fans, motors, etc., will begin work on its one-story addition, 105 x 125 ft., to cost $45,000. Klipstein & Rathmann, 316 North Eighth Street, are architects.

The Missouri Public Service Co., Kansas City, Mo., is said to have plans for extensions and improvements in its steam-operated electric power plant at Clinton, Mo., to double the present capacity, estimated to cost more than $500,000 with equipment. Extensions will be made, also, in transmission lines.

The Springfield City Water Co., Springfield, Mo., will make extensions and improvements in water plant and system to cost about $100,000, including an elevated steel tank and tower with capacity of 750,000 gal.

The Hardy Furniture Co., 1312 O Street, Lincoln, Neb., has plans for a four-story plant, 125 x 140 ft., to cost $100,000. Davis & Wilson, Lincoln, are architects.

The Interstate Zinc & Lead Co., Kansas City, Mo., has been organized to take over and expand the Cherokee Lead & Zinc Co., Oklahoma-Woodchuck Mine Co., the Hutcheon Management Co., and the Meteor Lead & Zinc Co., operating mining properties and mills in the Tri-State district. The new company has arranged for a bond issue of $1,000,000, a portion of the proceeds to be used for extensions and betterments, including the installation of machinery. R. M. Atwater, Jr., is president, and C. F. Dike, general manager.

The Spencer Trailer Co., Augusta, Kan., recently formed by Fred G. Spencer, Augusta, and associates, has acquired property near the city limits and plans the erection of a factory, for the manufacture of trailers for motor trucks, to cost about $30,000 with equipment.

The Highland Peach Orchards, Inc., Glenwood, Ark., is considering plans for a new box, crate and basket plant, one story, to cost about $100,000 with machinery.

The Board of Education, Wichita, Kan., plans the installation of manual training equipment in its proposed three-story high school, to cost $700,000 with equipment. Glenn H. Thomas, Wheeler-Kelley, Hagny Building, is architect.

The Westcott Valve Co., Bond Avenue, East St. Louis, Ill., has awarded a general contract to the Wimmer Construction Co., Victoria Building, St. Louis, for its one-story addition, 90 x 200 ft., to cost about $50,000 with equipment.

Cincinnati

CINCINNATI, Feb. 28.

MACHINE tool sales in February showed a slight increase over those in January, but total bookings the first two months of the year were only about 75 to 80 per cent of those in the corresponding period in 1926. Builders are disappointed at the slowness with which buyers are closing for equipment. Seldom in recent years have inquiries been better than at present, but much difficulty is experienced in converting them into orders. Purchases of equipment by automobile makers have been comparatively small, although one manufacturer has taken six lathes, this transaction raising to a total of 12 the number of machines bought by that company in the past three weeks. With the exception of an order for four lathes the remainder of the business placed by companies in the Detroit district has been confined to single machines. The Missouri Pacific has contracted for a lathe with a local builder. A Cincinnati company has sold three large lathes, one each for delivery to Spain, Canada and Mexico. The Virginia Electric & Power Co., Norfolk, Va., has purchased a No. 1 carwheel lathe.

The Dayton Hydraulic Co., Dayton, Ohio, has awarded a general contract to Frank Hill Smith, local, for a two-story factory to cost about $40,000. It will be occupied by the Vulcan Tool Co., which has acquired a long-term lease with privilege of purchase.

The Ohio Heat Treating Co., Dayton, Ohio, commercial steel treater, which has been operating as a partnership, has been incorporated with a capital stock of $15,000 and will carry on the work of hardening and tempering of tools, dies, screw machine products, gages, automobile parts and other

material requiring wear resisting qualities. The company expects to locate in a new building within the next year.

The R. K. LeBlond Machine Tool Co., Cincinnati, has acquired control of the Cincinnati Electrical Tool Co., in which it has substantial holdings.

The Cincinnati, Hamilton & Dayton Railway Co., Dayton, Ohio, has acquired possession of the plant formerly occupied by the Smith Gas Engineering Co. at Moraine City, and will expend approximately $500,000 in converting the building into car repair shops. Part of the above sum will be used to purchase equipment.

The Louisville & Nashville Railroad is contemplating the expansion of its present freight yards in the vicinity of De-Coursey and Spring Lake, Ky., and possibly the removal of its Covington, Ky., repair shops to the former location.

The United States Engineer, P. O. Box 72, Louisville, is asking bids until March 22 for machinery for a power house and turbine pit, including gate and valve operating machinery at lock and dam No. 47, Ohio River; also until March 21 for superstructures for power houses at dams Nos. 50, 52 and 53, Ohio River.

Fred Hunt, Somerset, Ky., contractor, is planning the purchase of a rock-crushing plant.

The Tennessee Metal Culvert Co., Nashville, Tenn., manufacturer of corrugated steel culverts and kindred products, is said to be arranging for the establishment of a plant at Memphis, Tenn., where operations will be concentrated in the future.

The United States Army, Air Service, Wright Field, Dayton, Ohio, Capt. Edward M. George, in charge, is said to have plans under consideration for a new air service station, with hangars, shops, etc., to cost more than $1,000,000. W. W. Berry, Wright Field, is engineer.

The City Council, Augusta, Ky., is considering the installation of deep-well pumping equipment at the municipal waterworks.

The Board of Education, City Hall, Chattanooga, Tenn., is considering the installation of manual training equipment in a proposed junior high school in the East Lake section, to cost close to $200,000, for which bids have been asked on a general contract. C. E. Bearden, First National Bank Building, is architect.

G. M. Bolinger, Mooresburg, Tenn., is planning the purchase of a woodworking lathe for turning chair parts.

The City Council, Franklin, Ky., is asking bids until March 15, for equipment for the municipal waterworks, including three motor-driven centrifugal pumping units, each with capacity of 1,000,000 gal., and one such unit with rating of 3,000,000 gal., and elevated steel tank and tower, with capacity of 100,000 gal., with accessory equipment. Klyce & Harrub, Fourth and First National Bank Building, Nashville, Tenn., are engineers.

Indiana

INDIANAPOLIS, Feb. 28.

PLANS are being drawn by the Chicago, Indianapolis & Louisville Railroad Co., 608 South Dearborn Street, Chicago, for new locomotive repair shops at Lafayette, Ind., one story, 80 x 500 ft., to cost $300,000 with equipment. A. S. Kent is company engineer.

The Millspaugh & Irish Co., 730 East Washington Street, Indianapolis, manufacturer of automobile bodies, has acquired the former plant of the Midwest Engine Co., consisting of about 20 buildings on a 25-acre tract. The property has been idle for several years. The new owner will remodel and will devote a considerable portion of the property to the manufacture of special bodies for Dodge Brothers, Inc., Detroit.

The Motor Oil Co., Eighteenth Street and the Wabash Railroad, Logansport, Ind., will soon take bids for a one-story storage and distributing plant, 42 x 130 ft., to cost about $45,000 with equipment. Carl J. Horn, Citizen's Loan & Trust Building, is architect.

The Scott Machine Works, Veedersburg, Ind., is arranging to rebuild the portion of its plant destroyed by fire Feb. 19, with loss close to $20,000 with equipment.

The Board of Education, Fort Wayne, Ind., plans the installation of manual training equipment in a two-story and basement addition to the Oxford School to cost $135,000, for which bids will be asked on a general contract in April. Pohlmeyer & Pohlmeyer, Central Building, are architects.

The H. S. Cover Co., South Michigan Road, South Bend, Ind., manufacturer of rubber products, has awarded a general contract to the H. G. Christman Co., 306 South Notre Dame Street, for a new one-story plant, 60 x 130 ft., to cost about $60,000 with equipment.

The City Council, Valparaiso, Ind., plans the installation of pumping machinery and a 1,000,000-gal. capacity elevated steel tank and tower in connection with extensions and improvements in the municipal waterworks. The project will cost $200,000. A. R. Putnam, City Hall, is engineer.

The Brazil Machine & Foundry Co., West Church Street, Brazil, Ind., has begun the manufacture of art bronze products and expects gradually to expand that department.

The Challenge Gauge & Tool Co., 18 West South Street, Indianapolis, has opened a branch factory at Eleventh Street and Cornell Avenue.

The Louisville & Nashville Railroad Co., has asked bids on a general contract for extensions to its facilities at Evansville, Ind., including a one-story engine house, machine shop, office and auxiliary structures.

The Valley Grove Foundry, Anderson, Ind., was destroyed by fire Feb. 16.

The Anderson-Vail Mfg. Co., Hammond, Ind., manufacturer of steel stampings, will build a two-story factory, 42 x 77 ft., to cost $35,000. James J. Marley, 5 North La Salle Street, Chicago, will receive bids.

Gulf States

BIRMINGHAM, Feb. 28.

THE Interstate Natural Gas Co., New Orleans, is completing plans for a new compressor station on the Ferriday-Vidalia Highway, with pipe lines, etc., in the New Orleans and Baton Rouge districts, to cost in excess of $500,000 with equipment. Ford & Davis, Inc., Louisiana Building, New Orleans, is consulting engineer.

The P. & B. Drivurself System, Houston, Tex., is completing plans for a new service, repair and garage building, four stories and basement, to cost $100,000 with equipment. John Eberson, 212 East Superior Street, Chicago, is architect.

The Florida Public Service Co., Orlando, Fla., has acquired property at Avon Park as a site for a new steam-operated electric generating plant, with initial capacity of 12,500 kw. It will be equipped for using both oil fuel and powdered coal, and is reported to cost in excess of $400,000 with transmission lines. The company is operated by the General Gas & Electric Corporation, 50 Pine Street, New York, W. S. Barstow, president.

W. M. Smith & Co., Birmingham, machinery dealers, have inquiries out for a number of 20-yd. capacity, two-way steel dump cars, and about 10 5-yd. steel dump cars, 36-in. gage; also for a 1000-lb. steam-hammer.

The Board of Commissioners, Bunnell, Fla., is asking bids until March 28 for waterworks equipment, including two 700-gal. per min. centrifugal pumps, one 400-gal. per min. centrifugal pump, one 250-gal. per min. centrifugal pump, 75,000-gal. capacity tank on 105-ft. steel tower, and auxiliary equipment. N. A. Hotard, New Smyrna, Fla., is engineer.

Ovens, power equipment, conveying and other machinery will be installed in the two-story plant, 140 x 200 ft., to be erected by the Fehr Baking Co., 1919 Comal Street, San Antonio, Tex., to cost about $125,000.

The Presidio Mining Co., Presidio, Tex., is completing plans for a new cyanide mill in the vicinity of Shafter, Tex., to cost approximately $200,000 with machinery. It is expected to ask bids in the spring.

The Emsco Derrick & Equipment Co., Houston, Tex., manufacturer of oil well equipment, is reported to be planning the construction of a new factory branch and distributing plant at Tulsa, Okla., with shops for repair and parts service.

The Boynton Lumber Co., Lufkin, Tex., has acquired the local hardwood mill and other property of the Philip A. Ryan Lumber Co. The new owner has plans for extensions, including the construction of a planing mill. The present hardwood plant will be remodeled and equipped for a combination hardwood and pine mill. The entire project will cost close to $60,000 with equipment. L. A. Boynton is president.

The Tampa Gas Co., Tampa, Fla., is arranging an extension and improvement program to cost about $400,000, including the installation of condensing, purifying, tar-extracting and other equipment. The capacity of the artificial gas plant will be increased.

The City Commission, Birmingham, has awarded a general contract to W. L. Coston, 3030 Avenue F, for the erection of its municipal central automobile service, repair and garage building, two stories, 140 x 150 ft., to cost $150,000 with equipment.

The Mississippi Ice & Utilities Co., Inc., Moss Point, Miss., has plans for a new one-story ice-manufacturing plant, to cost about $40,000 with machinery.

The Southern International Paper Co., Bastrop, La., recently formed by officials of the International Paper Co., 100

East Forty-second Street, New York, is completing plans for its new mill, to be operated in conjunction with the plant of the Louisiana Pulp & Paper Co., Bastrop. The company will take over wood pulp properties also, including about 150 acres of land in Garland and Hot Spring Counties. The entire project will cost more than $4,500,000.

The General Utilities & Operating Co., Monticello, Fla., has plans for a new ice-manufacturing, cold storage and refrigerating plant, to cost more than $125,000 with equipment. E. R. Doxier, Jr., is consulting engineer.

The Practical Tool & Steel Corporation, Fort Worth, Tex., manufacturer of oil well equipment, has plans for the immediate construction of a new one-story factory, 50 x 105 ft.

The Goodyear Tire & Rubber Co., Akron, Ohio, has awarded a general contract to the O. M. Gwin Construction Co., Union Indemnity Building, New Orleans, for a two-story factory branch and distributing plant at New Orleans, to cost about $60,000 with equipment. Emile Weil, Inc., Whitney Building, is engineer.

The Williams Sign Co., 800 West Sixth Street, Amarillo, Tex., has been incorporated with a capital stock of $30,000 to manufacture electric commercial signs. The company plans additions to its shop and equipment in the near future.

Canada

TORONTO, Feb. 28.

INQUIRIES for machine tools and equipment have increased. Some extensive industrial programs are under way in connection with new plants and additions for which considerable equipment will be required, and it is mostly for these undertakings that the present influx of inquiry deals. Current sales are chiefly in single tools for replacements, but some small lists have been closed the past few days. Imports are also increasing.

The Hobbs Storage Battery Corporation, 302 Bay Street, Toronto, has purchased a site at the corner of Spadina Avenue and Fleet Street, where a factory will be erected at a cost of $75,000.

Plans are being prepared by J. M. Miller, 364 Dorchester Street West, Montreal, for the erection of a wire manufacturing plant at Brockville, Ont., for the E. J. Phillips Electrical Works, Ltd., 579 De Gaspe Street, Montreal.

Plans are being prepared by engineering department of the Canada Crushed Stone Corporation, Ltd., Sun Life Building, Hamilton, Ont., for a plant and quarry at Hagersville, Ont.

The Public Works Department, Hunter Building, Ottawa, Ont., is preparing plans for workshops to be built at Ottawa at a cost of $133,000 for the Dominion Department of Public Works.

The Guelph Stove Co., Guelph, Ont., has awarded a number of contracts in connection with $40,000 addition to its plant. McGregor & McIntyre, 1139 Shaw Street, Toronto, will supply the structural steel.

The Kelvinator Co. of Canada, Ltd., London, Ont., is building an addition to its works there.

The Imperial Radiator Co., Ltd., 250 St. Helens Avenue, Toronto, will build an addition to its foundry to cost $10,000. The Jackson-Lewis Co., 1114 Federal Building, Toronto, is general contractor.

Prices are now being received by J. Astell, chairman Waterworks Board, Harriston, Ont., is connected with a proposed emergency power plant.

The Super Sash & Lumber Co., 573 Caledonia Road, Toronto, is having plans prepared for a factory on Gilbert Avenue.

Negotiations have been completed for the purchase of the plant of Canadian Vickers, Ltd., Montreal, by Canadian interests, from the parent concern. Control of the works will now be in the hands of Canadian interests. Those interested in the purchase include Playfairs of Toronto; James A. Richardson, Hon. Donat Raymon, F. M. Ross, Hon. J. M. Wilson and George Barr of Montreal.

Plans and specifications have been received from C. M. Croft, Canadian Trade Commissioner at Auckland, New Zealand, for equipment for the New Zealand Government Railways, Wellington. Bids will be received until June 13, by the chairman of the Railway Board, Wellington, New Zealand, for complete workshop machinery, electric cranes, etc.

Western Canada

About $2,000,000 will be expended this year in the Central Manitoba mining district. The Central Manitoba Mines, Ltd., Winnipeg, will build a crushing plant and undertake other development work at a cost of $1,000,000.

The Manufacturers' Oil & Refining Co., Edmonton, Alta., plans the erection of a refinery at Wainwright, Alta. Dr. N. M. Hardin is managing director.

Bids will be called on or about March 1 by the Winnipeg Hydroelectric System, 55 Princess Street, for the erection of a substation at Transcona to cost $50,000; also for an addition to a substation on King Street. The Hydroelectric System is also receiving bids on considerable electrical equipment for power plants, etc.

The Canadian Fishing Co., Ltd., Gore Avenue, Vancouver, B. C., will start work at once on a packing plant at Koprino Harbor, Quatino Sound, B. C., to cost $100,000.

Pacific Coast

SAN FRANCISCO, Feb. 23.

PLANS have been filed by Clarence A. Tantau, Shreve Building, San Francisco, architect, for a two-story automobile service, repair and garage building to cost $115,000 with equipment.

The Warman Electric Foundry Co., Huntington Park, Cal., manufacturer of electric steel castings, has tentative plans for one or more additions and installation of new equipment. The expansion is reported to cost about $50,000.

The Liberty Ornamental Iron Works, 2455 Valdez Street, Oakland, Cal., has awarded a general contract to the Art Builders, 1217 Fifth Avenue, for a new one-story plant to cost $21,000.

The Peoples' West Coast Hydro-Electric Corporation, South Bend, Wash., has secured a permit for the construction of a hydroelectric generating plant on the Nasel River, near South Bend, with power dam and transmission system, to cost about $250,000.

The Longview Fibre Co., Longview, Wash., has begun work on the first unit of its new pulp and paper mill. The entire project will cost in excess of $1,000,000 with machinery. R. A. Wertheimer, Kaukauna, Wis., is consulting engineer.

The Salinas Cold Storage & Ice Co., Salinas, Cal., is completing plans for a one-story ice-manufacturing and cold storage plant, to cost $150,000 with machinery. The La Faver Engineering Co., 545 Second Street, San Francisco, is architect.

The United States Indian Service, Wapato, Wash., L. M. Holt, supervising engineer, has secured an appropriation of $190,000 for the installation of a pumping plant for irrigation service in this district. Plans will be drawn soon.

The Pacific Gas & Electric Co., 245 Market Street, San Francisco, has approved the construction of a new equipment and repair building at Healdsburg, Cal., including service and garage for company trucks and cars. A similar works will be built, also, at Gilroy, Cal.

The Mesick & Mahy Mfg. Co., 1431 South Wall Street, Los Angeles, manufacturer of plated ware, silverware products, etc., has awarded a general contract to the Kaeding Construction Co., 741 South Alvarado Street, for its three-story addition, to cost about $50,000. John J. Frauenfelder, Story Building, is architect.

Branch Office Representatives of The Iron Age

Editorial

Chicago, Otis Bldg.....R. A. Fiske
Pittsburgh, Park Building.....G. F. Tegan
Cleveland, 1362 Hanna Building.....F. L. Prentiss
Cincinnati, First National Bank Bldg.....Burnham Finney
Boston, Park Square Bldg.....Gerard Fraser
Washington, Investment Bldg.....L. W. Moffett
San Francisco, 320 Market St.....Charles Downes

Advertising

Chicago, Otis Bldg.....F. S. Wayne
Pittsburgh, Park Bldg.....W. B. Robinson
Cleveland, 1362 Hanna Bldg.....Emerson Findley
Cincinnati, First National Bank Bldg.....D. G. Gardner
Boston, Park Square Bldg.....H. E. Barr
Philadelphia, Widener Bldg.....Charles Lundberg
Buffalo, 835 Ellicott Sq.....B. L. Herman
Detroit, 7338 Woodward Ave.....Peirce Lewis
Hartford, Conn., P. O. Box 81.....D. C. Warren
New Jersey, Hotel East Orange; East Orange, N. J. W. C. Sweetser
New York, 239 West Thirty-ninth St. W. C. Sweetser, Chester H. Ober
San Francisco, 320 Market St.....W. A. Douglas

The Tucson Gas, Electric Light & Power Co., East Tenth Street, Tucson, Ariz., has plans under way for enlargements in its steam-operated electric power plant. A Diesel engine unit and auxiliary machinery will be installed. Max A. Pooler, vice-president and general manager, is in charge.

Foreign

THE Bolivian Petroleum Co., now being organized jointly by the Bolivian Petroleum Corporation and the Atlantic Refining Co., 260 South Broad Street, Philadelphia, has arranged for a stock issue to total $700,000, a portion of the fund to be used for the development of oil properties in the western part of Bolivia, including installation of equipment, pipe lines, etc. The exploitation and development will be carried out under the direction of the Atlantic company. Reginald H. Johnson is president of the Bolivian organization, and Maxwell Stevenson, head of the Creole Syndicate, 25 Broadway, New York, vice-president and treasurer.

The Bombay Port Trust, Bombay, India, will carry out a port development program at Vizagapatam, to include the construction of a wharf for manganese ore, with conveying, loading and other handling machinery. The American consulate at Calcutta, India, Charles B. Spofford, Jr., trade commissioner, has information regarding the project.

The Montecatini Co., Milan, Italy, operating plants for the production of super-phosphate, ammonium sulphate and kindred products, has recently arranged for a loan of $10,000,000 in the United States, a portion of the fund to be used for extensions in plants and facilities.

The Paris-Orleans Railway, Paris, France, has plans for the electrification of its lines between Bretigny and Dourdan, and from Choisy-le-Roi to Orleans. A fund has been arranged and work will begin at an early date.

Plans are being arranged by a company at Lerida, Spain, for enlargements in its sulphuric acid and superphosphate plant and installation of new equipment. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference, Spain No. 47132. The American Consulate at Madrid, C. H. Cunningham, commercial attaché, also has information on the project.

The Inveresk Paper Co., Ltd., Musselburgh, near Edinburgh, Scotland, has recently acquired the mill and properties of Olive & Partington, Ltd., and is said to be planning extensions and improvements. The company has lately arranged for an increase in capital to $5,840,000, a portion of the fund to be used for expansion.

The Firestone Tire & Rubber Co., Akron, Ohio, is said to be planning to expend upward of $25,000,000 for the development and operation of crude rubber properties in Liberia. The work will include the construction of a narrow gage railroad, storage and distributing facilities, etc.

The Newton Steel Co., Youngstown, reports a net profit for 1926, after all charges and preferred dividend requirements, of $482,260, equivalent to $4.05 a share on the 100,000 shares of common stock. This compares with $786,230, or $7.04 a share, earned in 1925.

The Borg & Beck Co., Chicago, manufacturer of automobile clutches, shows net earnings for 1926 of $902,222, after all deductions, equal to $7.26 a share on the 125,000 shares of $10 par stock, and comparing with $668,932 or $5.35 a share in the previous year.

The Interstate Iron & Steel Co., Chicago, reports net income of $900,278 for the year ended Dec. 31, 1926, after 22½ per cent dividends paid on the preferred stock, 7 per cent of this amount being for the regular dividend accrued for 1926 and the remainder for dividends in arrears accrued prior to Sept. 1, 1924.

The Wheeling Steel Corporation on April 1, will pay, in addition to the regular quarterly dividends of $2 and $2.50 respectively on the preferred A and B stocks, deferred dividends of 60c. per share on the A preferred and 75c. on the B preferred stock. These payments wipe out dividends on which the company has been in arrears since 1925.

The Sullivan Machinery Co., Chicago, reports a net income for 1926 of $951,757 after depreciation and reserve, compared with $712,892 in 1925.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

The Happy Thought Foundry Co., Brantford, Ont., will increase its operations. . . .
—THE IRON AGE, Feb. 17, 1927.

The Voice with a Smile *Molds.*

It's All in the Point of View

From THE IRON AGE, Feb. 17

Page 493

"Antiquated methods of production still prevail in the foundry industry. Other industries have recognized that installation of modern machinery and methods must be given consideration."—*Harry D. Neach.*

Page 499

"The principal points which make for the superiority of the American foundry are the use of material-handling machinery to an extent not followed in France, and mass production, with a flow of work through the plant which makes for small stocks of material." — *H. Magdelenat, vice-president of the French Foundry Association.*

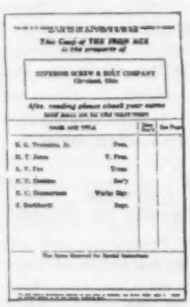
With Mr. Black in charge of the blast furnaces and Mr. Brown supervising the open-hearth plant, the Compania Siderurgica del Mediterraneo, Sagunto, Spain, had the nucleus of a harmonious executive color scheme.

A rolling mill superintendent surnamed White or at least Gray would have fitted in nicely, but an uncomfortable affection for the verities compels us to admit that the gentleman occupying this responsible position is Anton Getz, whose name does not denote a color in any language known to us.

First Aid to Traffic Jams

The tool hardener should be kept informed of the pertinent developments in his line, through the trade journals . . . This information is often found in the hands of the higher executives, where it frequently dies in a traffic jam. . . .

These words of truth are uttered by E. V. Gilbert, Collinsville, Conn. In some organizations useful information is directed to the man who can make the best use of it, with the same speed and precision a train dispatcher exhibits during the 5:30 exodus of commuters.



In others, information that might be invaluable to the company, if directed to the proper individual, meets the fate of the far-famed desert rose, at least as far as that manufacturer is concerned.

To prevent traffic jams, THE IRON AGE furnishes gratis to each subscriber, specially printed routing slips, bearing the name of each executive who can use to advantage the information this paper contains. If you have not received your slips, send the list to us at 239 West Thirty-ninth Street, New York.

Shades of T. R.!

For the first time since it was established and had a quorum present the Federal Trade Commission in January did not issue a complaint. *A. H. D.*